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L. C. CORBETT.

COLLEGE OF AGRICULTURE
DAVIS, CALIFORNIA

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TRANSACTIONS

OF THE

Iowa State Horticultural Society

FOR 1887,

TWENTY-SECOND ANNUAL MEETING,

HELD AT

Des Moines, January 17, 18, 19, 1888.

ALSO PROCEEDINGS OF THE

WESTERN, EASTERN AND NORTHERN SOCIETIES, WITH SUMMARY OF OTHER LOCAL SOCIETIES FOR THE YEAR 1887.

EDITED BY GEO. VAN HOUTEN, SECRETARY, LENOX, IOWA.

VOLUME XXII.

PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

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GEO. E. ROBERTS, STATE PRINTER.
1888.

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Report to the Governor.

LENOX, IOWA, Feb. 6, 1888.

To his Excellency, WILLIAM LARRABEE:

SIR—I have the honor to submit herewith, in compliance with legal requisition, the twenty-second volume of the transactions of the Iowa State Horticultural Society, with supplementary reports and papers.

Very respectfully yours,

GEO. VAN HOUTEN,
Secretary Iowa State Horticultural Society.

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OFFICERS AND DIRECTORS

OF THE

IOWA STATE HORTICULTURAL SOCIETY.

FOR THE YEAR 1887.

PRESIDENT.

C. G. PATTEN, - - - - - - - *Charles City.*

VICE-PRESIDENT.

EUGENE SECOR, - - - - - - - *Forest City.*

SECRETARY.

GEORGE VAN HOUTEN, - - - - - - *Lenox.*

TREASURER.

HENRY STROHM, - - - - - - - *Iowa City.*

DIRECTORS.

First	*District*—JONATHAN THATCHER - -	*Bonaparte.*
Second	*District*—F. W. TAYLOR, - - - -	*Creston.*
Third	*District*—A. F. COLLMAN, - - -	*Corning.*
Fourth	*District*—N. K. FLUKE, - - - -	*Davenport.*
Fifth	*District*—H. W. LATHROP, - - -	*Iowa City.*
Sixth	*District*—C. L. WATROUS, - - - -	*Des Moines.*
Seventh	*District*—H. A. JOHNS, - - - -	*Sioux City.*
Eighth	*District*—R. P. SPEER, - - - -	*Cedar Falls.*
Ninth	*District*—A. J. HAVILAND, - - - -	*Fort Dodge.*
Tenth	*District*—M. VINCENT, - - - -	*Le Mars.*
Eleventh	*District*—C. F. GARDNER, - - - -	*Osage.*
Twelfth	*District*—J. M. ELDER, - - - -	*Concord.*

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OFFICERS

OF THE

IOWA STATE HORTICULTURAL SOCIETY.

FOR THE YEAR 1888.

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SECRETARY.

GEORGE VAN HOUTEN, - - - - - *Lenox.*

TREASURER.

HENRY STROHM, - - - - *Iowa City.*

LIBRARIAN AND CUSTODIAN.

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DIRECTORS.

First	*District*—JONATHAN THATCHER, - -	*Bonaparte.*
Second	*District*—F. H. BRUNING - - - -	*Kent.*
Third	*District*—A. F. COLLMAN, - - -	*Corning.*
Fourth	*District*—N. K. FLUKE, - - -	*Davenport.*
Fifth	*District*—H. W. LATHROP, - - -	*Iowa City.*
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Ninth	*District*—A. J. HAVILAND, - - -	*Fort Dodge.*
Tenth	*District*—M. E. HINCKLEY, - - -	*Marcus.*
Eleventh	*District*—C. F. GARDNER, - - - -	*Osage.*
Twelfth	*District*—J. M. ELDER, - - -	*Concord.*

Vacancy in Tenth District, filled as above, by Executive Committee.

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FRUIT DISTRICTS OF IOWA.

REPRESENTED BY THE DIRECTORS NAMED ON PRECEDING PAGE.

First District—Is composed of the counties of Lee, Des Moines, Louisa, Henry, Washington, Jefferson, Van Buren, Keokuk, Wapello and Davis.

Second District—Mahaska, Monroe, Appanoose, Marion, Lucas, Wayne, Clarke, Decatur, Ringgold and Union.

Third District—Adams, Taylor, Montgomery, Page, Mills, Fremont, Pottawattamie, Cass, Audubon, Shelby and Harrison.

Fourth District—Muscatine, Scott, Clinton, Jackson, Jones, Cedar and Linn.

Fifth District—Benton, Johnson, Iowa, Tama, Poweshiek, Marshall and Jasper.

Sixth District—Story, Polk, Warren, Boone, Dallas, Madison, Adair, Greene and Guthrie.

Seventh District—Carroll, Crawford, Monona, Woodbury, Ida and Sac.

Eighth District—Dubuque, Clayton, Delaware, Fayette, Buchanan, Black Hawk and Grundy.

Ninth District—Butler, Franklin, Hardin, Wright, Hamilton, Humboldt, Webster, Calhoun and Pocahontas.

Tenth District—Buena Vista, Cherokee, Plymouth, Sioux and O'Brien.

Eleventh District—Allamakee, Winneshiek, Howard, Chickasaw, Mitchell, Floyd, Worth, Cerro Gordo and Bremer.

Twelfth District—Winnebago, Hancock, Kossuth, Emmet, Palo Alto, Dickinson, Clay, Osceola and Lyon.

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MEMBERS FOR 1888.

This will include all names received by the secretary up to date of writing this report. Membership $1.00, which entitles members to one copy of the annual report by mail. Membership expires on the day preceding the annual meeting of each year.

ANNUAL MEMBERS.

R. P. Speer.....Cedar Falls.
George Rambach.....Cedar Falls.
M. C. Staves.....Des Moines.
J. M. Elder.....Concord.
N. T. Case.....East Des Moines.
E. T. Edmunson.....Perry.
John Craig.....Ames.
S. W. Wilson.....Atlantic.
S. L. Morrison.....Chariton.
M. B. Sturgers.....Des Moines.
George D. Thomas.....Des Moines.
John Barden.....Des Moines.
W. A. Koontz.....Albia.
C. W. Burton.....Cedar Rapids.
A. O. Barnes.....Knoxville.
F. W. Taylor, 307 S. 16th st.....Omaha, Neb.
J. Karnes.....Des Moines.
W. M. Bomberger.....Harlan.
J. W. Murphy.....Glenwood.
L. A. Williams.....Glenwood.
M. H. Byers.....Glenwood.
E. W. Taggart.....Price, Audubon county.
A. C. Barrows.....Ames.
A. F. Collman.....Corning.
R. D. McGeehon.....Atlantic.
L. Kauffman.....Iowa City.
R. Robinson.....Des Moines.
J. H. Shafer.....Bevington.
Prof. H. Osborn.....Ames.
Charles N. Page.....Des Moines.
F. H. Bruning.....Kent.

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T. N. Boutell.....Fort Dodge.
C. B. Andrews.....Kalo, Webster county.
C. H. Good, 1174 13th st.....Des Moines.
H. Hutsonpillar, Lock box 193.....E. Des Moines.
C. F. Kimball.....Des Moines.
John S. Friedley.....Boone.
M. E. Hinkley.....Marcus.
Anthony M. Miller.....Des Moines.
Theodore Williams, 203 S. 9th st.....Omaha, Neb.
W. E. Hamilton.....Morning Sun.
Chas D. Price.....Ruthven, Palo Alto county.
W. H. Guilford.....Dubuque.
Christian Steinman.....Mapleton.
C. Rowse.....Independence.
Ole Stanwold.....Trysil, Dakota.
C. M. Cady.....Stuart.
W. S. Fultz.....Muscatine.
Charles Mead.....Rochester, Racine county, Wis.

HONORARY MEMBERS.

Charles Patterson.....Kirkville, Missouri.
J. C. Plumb.....Milton, Wisconsin.
C. A. Mosier.....Des Moines.

LIFE MEMBERS.*

H. R. Teller, (deceased).....Albia.
G. A. Knowles.....La Porte.
A. J. Haviland.....Fort Dodge.
J. L. Budd.....Ames.
E. R. Heisz.....Nora Springs.
E. H. Calkins.....Burlington.
Jonathan Thatcher.....Bonaparte.
J. T. Frame.....West Branch.
D. C. Williams.....Cedar Falls.
H. C. Raymond.....Council Bluffs.
Alex. Peddie.....Emmetsburg.
James Lonsdale.....Dale City.
C. L. Watrous.....Des Moines.
Lawrie Tatum.....Springdale.
N. K. Fluke.....Davenport.
A. E. Garrison.....Des Moines.
Hon. Wm Larrabee.....Clermont.
George S. Bacon.....Des Moines.
W. C. Monroe.....Anamosa.
H. Strohm.....Iowa City.

*The fee for life membership is $5.00. This fund is for permanent investment, the interest only to be used.

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Theodore Wegmann ..... Roselle.
B. F. Gue ..... Des Moines.
W. T. Worth ..... Climbing Hill, Woodbury county.
Harvey Baker ..... Pleasant Prairie, Muscatine county.
Charles Gibb ..... Abbotsford, Canada.
Ernest Eggerth ..... Elkport, Clayton county.
John S. Hicks ..... Roslyn, Long Island.
M. Pugsley ..... Woodbine.
Silas G. Goss ..... Border Plains.
J. S. B. Thompson ..... Grundy Center.
N. A. Reeves ..... Waverly.
Enoch Mead ..... Davenport.
A. G. Williams ..... Chester Center.
Charles F. Gardner ..... Osage.
C. B. Royer ..... Dallas Center.
A. H. Lawrence ..... Le Mars.
Silas Wilson ..... Atlantic.
D. A. Porterfield ..... Traer.
J. Wragg ..... Waukee.
John E. Corlett ..... Farmersburg.
B. O. Curtis ..... Paris, Ill.
E. Y. French ..... Epworth.
Edward Hoyt ..... Scotch Grove.
A. W. Harris ..... Manly.
E. A. Hallett ..... Galena, Ill.
John Lister ..... Conrad Grove.
George Van Houten ..... Lenox.
Elmer M. Reeves ..... Waverly.
John Putz ..... Elkport.
Henry W. Rarey ..... Whipple.
W. C. Haviland ..... Fort Dodge.
J. M. Prouty ..... Humboldt.
F. G. Dewey ..... Esmond, Dakota.
Dwight Bannister ..... Ottumwa.
Matt Parrott ..... Waterloo.
W. H. Lewis ..... Winterset.
John A. Hoffman ..... Roselle.
Prof. M. F. Arey ..... Fort Dodge.
Eugene Secor ..... Forest City.
E. M. Sherman ..... Charles City.
W. Green ..... Davenport.
R. G. Moon ..... Bedford.
David Atkin ..... Amber.
H. P. Williams ..... Larchwood.
James D. Rowen ..... Des Moines.

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HONORARY LIFE MEMBERS.

J. B. Grinnell ..... Grinnell.
James Smith ..... Chresbard, Dakota.
G. B. Brackett ..... Denmark.
Suel Foster (deceased) ..... Muscatine.
H. W. Lathrop ..... Iowa City.
Peter M. Gideon ..... Excelsior, Minnesota.
C. F. Clarkson ..... Des Moines.
J. H. Gear ..... Burlington.
A. S. Welch ..... Ames.
C. E. Bessey ..... Lincoln, Neb.
G. Hinrichs ..... Iowa City.
John Scott ..... Nevada.
E. R. Shankland ..... Dubuque.
Mrs. Mary Cherry Hand ..... Charles City.

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STANDING COMMITTEES FOR 1888.

It is earnestly hoped that each one appointed on these committees will report separately on subject assigned, and if possible be present to read paper at the annual meeting to be held in Des Moines, on the third Tuesday in January, 1889; but if not able to be present, please send paper to the secretary before the annual meeting.

TOP GRAFTING.

R. P. Speer, Cedar Falls.
N. K. Fluke, Davenport.

ORNAMENTATION OF COUNTRY HOMES.

C. W. Burton, Cedar Rapids.

LANDSCAPING.

George Van Houten, Lenox.

FORESTRY.

John Wragg, Waukee.
H. W. Lathrop, Iowa City.

METEOROLOGY OF NORTHERN IOWA IN ITS RELATION TO HORTICULTURE.

J. M. Elder, Concord.

ORCHARDING.

A. F. Collman, Corning.

GRAPE PRUNING.

W. M. Bomberger, Harlan.

SUBJECT TO BE CHOSEN.

Jonathan Thatcher, Bonaparte.

HORTICULTURE IN DAKOTA.

E. De Bell, Sioux Falls, Dakota.

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VARIABILITY OF PLANTS UNDER DIFFERENT CLIMATIC CONDITIONS.

G. B. Brackett, Denmark.

HORTICULTURE IN ITS RELATION TO AGRICULTURE.

President W. I. Chamberlain, Ames.

MARKET GARDENING.

L. G. Clute, Manchester.

SMALL FRUITS FOR MARKET.

Charles Root, Hopkinton.

DRAINAGE—ECONOMIC AND SANITARY.

Professor E. W. Stanton, Ames.

SUBJECT TO BE CHOSEN.

Dr. Gustavus Hinrichs, Iowa City.

DEVELOPMENT OF FRUITS AND PLANTS FROM NATIVE FORMS.

C L. Watrous. Des Moines.

HOME ADORNMENT.

Mrs. Minnie T. Hatch, Des Moines.

TREES FOR STREET AND ORNAMENTAL PLANTING.

C. A. Mosier, Des Moines.

OBSERVATIONS ON THE HORTICULTURE OF THE PACIFIC COAST.

Professor J. L. Budd, Ames.

SUBJECT TO BE CHOSEN.

Silas Wilson, Atlantic.

EVERGREENS FOR PRAIRIE HOMES.

John C. Ferris, Hampton.

STRAWBERRIES AND RASPBERRIES FOR NORTHERN IOWA.

C. F. Gardner, Osage.

BLACKBERRIES AND OTHER SMALL FRUITS.

Elmer Reeves, Waverly.

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GRAPES FOR NORTHERN IOWA.

O A. Kenyon, McGregor.

IMPROVEMENT OF NATIVE PLUMS.

H. A. Terry, Crescent City.

PEARS FOR SOUTHERN IOWA.

George Shaw, Garden Grove.

ORNAMENTAL SHRUBS.

Jerome Bock, Burlington.

SUBJECT TO BE CHOSEN.

A G. Williams, Chester Center.

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MEMBERS OF COMMITTEE IN CHARGE OF EXPERIMENTAL STATIONS.

MEMBERS ELECTED IN 1883.

J. L. Budd.....Ames.
G. B. Brackett.....Denmark.
C. G. Patten.....Charles City.
C. L. Watrous.....Des Moines.

MEMBERS ELECTED IN 1884.

Silas Wilson.....Atlantic.
W. C. Haviland.....Fort Dodge.
H. A. Terry.....Crescent City.
O. A. Kenyon.....McGregor.
A. F. Collman.....Corning.
R. P. Speer.....Cedar Falls.
Eugene Secor.....Forest City.
M. E. Hinkley.....Marcus.

MEMBERS ELECTED IN 1885.

A. G. Williams.....Chester Center.
J. C. Ferris.....Hampton.
John Wragg.....Waukee.
F. W. Taylor.....Creston.

MEMBERS ELECTED IN 1887.

W. H. Gullford.....Center Grove.
H. A. Johns.....Sioux City.
George Van Houten.....Lenox.
Chas. F. Gardner.....Osage.

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PREMIUMS.

PREMIUMS ON FRUITS AND FLOWERS.

To be awarded at the annual meeting of the State Horticultural Society at Des Moines, third Tuesday in January, 1889.

Where the word "fruit" occurs in this list, grafted fruit is meant, except where otherwise specified.

*Best collection of fruit grown in any one county	$ 20.00
Second best collection of fruit grown in any one county	10.00
Best collection of fruit grown in any county in Northern Iowa, north of the north line of Clinton county	20.00
Second best collection of fruit grown in any county in Northern Iowa, north of the north line of Clinton county	10.00
Best collection of fruit grown by exhibitor	10 00
Second best collection of fruit grown by exhibitor	5.00
Best collection of seedling apples grown by exhibitor	10.00
Second best collection of seedling apples grown by exhibitor	5.00
Best plate of any one of the approved varieties of the apple	3.00
Second best plate of any one of the approved varieties of the apple	2.00

PREMIUMS ON FLOWERS AND PLANTS.

Best collection of green-house plants	$ 15.00
Best collection of house plants	10.00
Second best collection house plants	5.00
Best collection of foliage plants	5.00
Best collection of plants, *in bloom*, including roses	8.00
Second best collection of plants, *in bloom*, including roses	5.00
Best single foliage plants	3.00
Best rose in bloom	3.00
Best hanging basket or vase of vines or plants	3.00

This list of premiums on flowers and plants, it is hoped, will bring out large collections. If collections be meager, the committee may award second premiums if, in their judgment, a first premium is not merited.

Exhibitors must make entries with Secretary for *specific premiums*.

*NOTE—It is not the object of the Society to encourage the exhibition of a great number of varieties irrespective of value of tree, productiveness, hardiness, etc. Hence the committee will interpret the words "best collection" to mean *best specimens* of our most satisfactory varieties for the several districts.

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STATE HORTICULTURAL SOCIETY.

LIST OF PREMIUMS.

Offered for the Encouragement of Forest Tree Planting.

The following premiums are offered to encourage the planting of trees in permanent timber plantations or belts; the number of trees living to be ascertained by actual count between the 15th of September and the 10th of October, 1888. The award of the premium to depend upon a full compliance with the rules appended to the schedule of premiums:

For the greatest number planted in groves; intrinsic value of species considered	$ 40.00
Second greatest number	25.00
Third greatest number	10.00
For the greatest number of Evergreens and Larch in plantations or belts	20.00
Second greatest number	15.00
Third greatest number	10.00
For the greatest number of Ash trees	20.00
Second greatest number	15.00
Third greatest number	10.00
The greatest number of nut bearing trees, including Oaks	20.00
Second greatest number	15.00
Third greatest number	10.00
For the greatest number of Black Wild Cherry, Elm, Box-elder, Birch or Catalpa *Speciosa*	20.00
Second greatest number	15.00
Third greatest number	10.00
For the greatest number of Cottonwood, Basswood, Willow, Maple, and other soft wooded trees	20.00
Second greatest number	15.00
Third greatest number	10.00
For the greatest number of Honey Locust (from seed grown on thornless trees is preferable)	20.00
Second greatest number	15.00
Third greatest number	10.00

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REGULATIONS.

First. Persons competing for premiums must designate the class for which they compete; as for the greatest number of soft wooded trees, greatest number Evergreens, Larches, etc. A plantation may consist of a single variety enumerated, or any number of the kinds mentioned.

Second. Additional plantations must be made for each separate entry for premiums. In other words, a person awarded a premium in one class will not be entitled to premiums on same trees in another class.

Third. The plantations competing for these premiums must be made with rooted seedlings or plants, with the exceptions herein mentioned: of Willows and soft-wooded trees, growing readily from cuttings, strong cuttings may be used. In the class of nut-bearing trees, White Walnut, Black Walnut and Oak may be started from seed where wanted to remain. Plantations of Ash, Maple, Black Cherry, or any other forest tree, may be started from seeds, where they are to stand permanently, but they cannot be entered for premium until the close of the second year's growth.

Fourth. All trees, seeds and cuttings must be planted in permanent timber plantations or belts, in the spring of 1888, except where parties failed to get a sufficient stand in 1887, they may replant in 1888. The plantation must not be made at a greater distance than four feet each way; when counted there must be at least two thousand trees to each acre. The plantations competing for premiums must be on one farm, but need not be contiguous.

Fifth. The competitor must have his trees counted by two disinterested witnesses between the 15th of September and the 10th of October, counting only those that are alive at that time. After counting, competitors must make affidavit before a justice of the peace or notary public, to the following facts:

A. Whole number of trees in permanent grove, planted in spring of 1888, and now alive; or if it is a replanted grove, planted in 1887, state the fact.

B. Name and number of each kind planted.

C. How planted.

D. How cultivated.

E. Cost of cultivation.

F. Average size of each species of trees.

The parties who counted the trees must append their affidavits as to the correctness of the count. The officer who administers the affidavits shall certify to the identity and credibility of the competitor, and the parties who counted the trees.

Sixth. The above described affidavits to be forwarded to the Secretary of the State Horticultural Society, not later than December 1, 1888.

Seventh. Premiums will be awarded at the next regular meeting of the Society at Des Moines, on the third Tuesday in January, 1889.

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LIST OF PREMIUMS.

Offered for the production of seedling fruits.

DISTRICTS.

The State will be divided into two districts, with a view to adaptation of varieties to our varied soil and climate.

1. The North District shall include the counties north of the north line of Linn county, or the county lines nearest thereto across the State.
2. The South District shall include the counties south of the above line.

STANDARD OF HARDINESS, SIZE, QUALITY, ETC.

1. The variety of the apple worthy of first premium in the North District, must be as hardy and productive in trees as the Duchess, and the fruit as good in quality as Wealthy. In average size it must not be less than two and three-fourths inches in diameter, and it must keep, with ordinary care, until April or later.
2. In the South District the Duchess shall be the standard as to hardiness and productiveness of tree, and size of fruit, while the quality must equal Grimes' Golden and its keeping capacity the Willow.

REGULATIONS.

1. Any fruit to obtain first premium must excel any known sort in enough of the essentials of hardiness, productiveness, healthfulness and vigor of tree, vine or plant, also of size and general appearance of fruit, quality for dessert, cooking, canning, shipping and keeping, to stamp it clearly in advance of any other variety grown in the District at time of awarding premium.
2. No premium will be awarded on any orchard fruit, or small fruit, from seedling which bore fruit prior to 1885.
3. Before a second premium shall be paid, scions, cuttings, or plants shall be furnished the Society for use of the Experimental Committee, the quantity to be fixed by the Society.
4. A member of Visiting Committee of the Society living in the District may be ordered to visit and report on the leaf, habit, apparent vigor, etc., of any variety competing for the second award in the cumulative list of premiums.
5. We would recommend the election by ballot of a committee of three to award premiums on orchard fruits, and a like committee on small fruits, and we recommend the election of said committee by the Directors and officers of the Society.

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6. All seedings must be grown from seed in Iowa, and must be fruited in the District from which they are entered for premium.

Annual premium	$ 20.00
Second premium	15.00
Third premium	10.00
At the end of five years the variety taking the first premium three years out of five will receive a premium of	50.00
Second premium	37.50
Third premium	25.00

During the second, third and fourth periods of five years each the annual premium will remain the same as first year, and at end of each period the successful variety will receive successively $75.00, $100.00 and $200.00; the second and third premiums proportioned as above.

PREMIUMS ON CHERRY SEEDLINGS.

The successful variety of the cherry must prove as hardy as the apple for the respective districts, and the quality and size of fruit must excel the Early Richmond.

The award of premiums will be the same in amount annually as in the pear list, and the premiums at the end of each five years the same, but the final premium will be awarded at the close of the third period.

PREMIUMS ON PLUMS.

The successful seedling plum shall equal the De Soto in hardiness and productiveness, and superior to it in size and quality.

Premiums will duplicate those of cherry list in amount and periods of trial.

PREMIUMS ON GRAPES.

The successful grape must ripen one week earlier than Worden and be equal in productiveness and size, but must excel it in quality and hardiness of vine.

The premiums on the grape, and the small fruits generally, will be open to the whole State, and will not be duplicated in the Districts as with the orchard fruits.

Best seedling grape	$ 20.00
Second best	15.00
Third best	10.00
At end of five years the variety taking three out of five premiums will receive	100.00
Second best	75.00
Third best	50.00
During the second period the annual premiums remain the same, and at end of ten years the successful variety will receive	200.00
Second best	150.00
Third best	100.00

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PREMIUMS ON OTHER SMALL FRUITS.

The successful seedling of the Currant, Gooseberry, Raspberry, Blackberry and Strawberry shall receive a premium of	$ 10.00
Second premium	7.50
Third premium	5.00
At end of seven years the variety of either fruit taking five first premiums out of a possible seven will be awarded	50.00
Second award	37.50
Third award	25.00

We recommend that the currant receiving first premium must equal the Long Bunched Holland in perfection of growth and leaf; must equal the White grape in quality of fruit, and must reach the size of the Fay.

The gooseberry must equal the Houghton in hardiness and productiveness and the fruit in size and quality must compare favorably with the best English sorts.

The raspberry must be as hardy as Shaffer's Colossal, and superior to it in quality and color of fruit. If a black variety it must be hardier than Tyler, and excel it in productiveness, size and quality of fruit.

The strawberry must be as hardy and productive as Crescent, as large and good in fruit as the Charles Downing, and as good in color and capacity for shipping as Wilson.

The blackberry must be hardier than Snyder and superior to it in size, productiveness and quality.

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PROCEEDINGS

OF THE

TWENTY-SECOND ANNUAL SESSION

OF THE

IOWA STATE HORTICULTURAL SOCIETY,

HELD AT

DES MOINES, IOWA,

January 17, 18 and 19, 1888.

The Society met in Horticultural Rooms of the Capitol at 10 A. M. Tuesday. Officers present, C. G. Patten, President; Eugene Secor, Vice-President; Geo. Van Houten, Secretary; H. Strohm, Treasurer. Several Directors and about twenty members were present.

The session was opened with prayer by Geo. Van Houten.

An opportunity was given for renewal of membership, after which the report of Director Jonathan Thatcher, of first district, was called for and read as follows:

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REPORT OF DIRECTOR OF FIRST DISTRICT.

BY JONATHAN THATCHER.

I feel a great delicacy in coming before you, year after year with gloomy reports from the first district, after having such glowing reports from this district in former years.

I have to report the poorest apple crop this year (if it can be called a crop at all) that has ever been raised in this district since the society came into existence, and of very inferior quality, being wormy, small and knotty. The coddling moth has been the worst I ever saw. Take the entire district over and I don't believe there is one apple in ten which has not been more or less injured by it, and I have been through seven of the ten counties in person. In the local markets we find principally Roman-stems and a few Ben Davis and Janets. The Grimes Golden did fair, but the farmers are getting too smart to take them to market. Notwithstanding they are still being duped by tree-peddlers with untried varieties (mostly Russian).

As to varieties of the apple I have nothing new to add, and still stand by my last report.

Some years ago Mr. Calkins told us that there seemed to be a tendency to "overproduction of the lower grades (in quality) of apples, such as Ben Davis and Janets," and said "we must check this tendency, as the iron horse is penetrating our State to such an extent as to bring us into direct competition with the Greenings, Baldwins, etc., of Michigan," and that "we must educate our tastes to higher standard." Recent results seem to indicate "our tastes" occupy a high enough "standard" for the apples we are getting from Michigan at present. The markets at Bonaparte, Van Buren county, are supplied with Michigan Ben Davis and Janet apples retailing at one dollar and ten cents per bushel, or thirty cents per peck, and Janets, home-grown are bringing the same price, and as far as I can learn no apples of any variety can be bought anywhere in the first district for less than $1 per bushel. From the above it would appear that we better "educate our tastes" for such varieties as we are able to produce or procure at present. The supply of Janets is not equal to the demand in Van Buren county.

All fruits ripened fully one month earlier than usual the past autumn. Janets were good to eat from the hand before Christmas. And Grimes' Golden and Romanstems were good before the 1st of December. My Pearmains were as fine in quality as I have ever raised, but few in quantity.

Small fruits were generally very light crops, owing to drouth. Blackberries were almost a failure, drying up on the vines before maturing, although the set of fruit was exceedingly heavy. Snyder being the main variety and continues to give the best satisfaction.

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RASPBERRY—Half-crop, quality good. Among the blackcaps the Mammoth Cluster, and among the red the Turner gave the best satisfaction. Retail price in the different local markets of all the district, ten to twelve cents per quart, the interior towns ranging at the latter price. The crop of strawberries was about the same as the raspberry, being cut short considerably by the drouth. The prospect early in the season was as good as I every saw it. But notwithstanding the drouth, I raised the finest crop (to the size of it) where I now live (on the open prairie) that I have ever raised. We picked 132 quarts from a strip of ground one rod wide by three and one-half rods long, and I am confident that one good rain ten days before we finished would have given us 40 quarts more. The varieties were Jersey Queen, Red Jacket and a new variety that originated in my meadow near my strawberry plat at Keosauqua; one-half was Red Jacket, the other half about equal between Jersey Queen and the new variety. The last named is about the size of the Crescent, and fully as prolific; but for size, beauty and quality the Jersey Queen beats anything that I ever raised. I raised larger ones than I ever saw of the Sharpless, and much more symmetrical in shape, sweet, juicy and void of the hard, white core of the latter.

THE PLUM was an entire failure as far as my observation goes. Cherries a very light crop. We had plenty of May cherries for our own use from three trees on their own roots, in one corner of our door-yard in heavy blue-grass. I don't give this kind of culture as an example, but simply as a fact. Fruit trees have generally gone into winter quarters in good condition to stand the rigors of a hard winter, but the temperature has not been very low yet (January 12) notwithstanding we have had some very rough weather and several blizzards.

Since writing the above, I have learned that apples are retailing from the groceries at Keokuk at forty cents per peck, and selling at wholesale at $3.25 per barrel.

LATER—(January 16). Yesterday morning temperature was 24 degrees below zero, and at noon 14 degrees below; at 9 P. M. 25 below. This morning 18 below; at noon 4 above. Suppose this will settle the peach question.

DISCUSSION ON REPORT:

R. P. Speer: How is foliage of Red Jacket with you?

J. Thatcher: It scorches or sunscalds worst of any, but gives good results.

H. W. Lathrop: As Mr. Thatcher is in the oldest fruit growing section in the state, I wish to know if new orchards are being planted, and if so, how they are doing?

J. Thatcher: New orchards are being planted. Along the Des Moines river the new orchards are about as badly damaged as the old ones. In my own orchard many trees are badly damaged. A warm rain in August, three years ago, started the trees into a late growth,

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and many varieties were killed. Romanstem and Fameuse least injured of common varieties. Iowa Blush, Wealthy, and Duchess have done well, but we did not have these three varieties in our old orchards.

C. L. Watrous: I would like to know, if when these varieties were injured, there were other varieties on trial?

J. Thatcher: There were but few varieties in that orchard. The Ben. Davis were killed.

A paper, Demands Made by Horticulture upon the Science of Botany, by Prof. C. E. Bessey, was read by the secretary.

THE DEMANDS MADE BY HORTICULTURE UPON THE SCIENCE OF BOTANY.

BY CHARLES E. BESSEY, PH. D., LINCOLN, NEB.

As a teacher of botany in one of the industrial colleges of the country, I wish to call attention to the demand for higher work which is being made by horticulture upon the science of botany,—a demand which I have reason to fear is still ignored in some places. An examination of the catalogues of many colleges, together with an acquaintance with the methods pursued, derived from personal interviews with the teachers, shows that in many colleges the instruction in botany has scarcely risen above the grade of the "girls'-school botany" of twenty-five or thirty years ago, when all that was expected of the pupil was that he should be able to give the technical names of all the parts of a flowering plant, giving with exactness the particular form of its roots, stem, leaves, inflorescence, the technical anatomy of its flowers and its fruit. All this led directly to the second object,—the technical name of the plant and its position in some system of classification. Add to this the making of a little collection of fifty or a hundred dried plants, ambitiously styled an *herbarium*, and the listening to a course of lectures on "Cryptogamic Botany," and we have the sum total of the work expected of the student in "going through botany."

Now, this is no fancy sketch. There were many colleges a few years ago which maintained even poorer courses in botany than this which I have drawn, and it is no difficult matter to find a great many to-day which have made little or no improvement upon it. It would be an injustice to the industrial colleges were I to fail to say that, in the making of improvements upon the old methods, they have generally been more active than the ordi-

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nary colleges. Badly as botany has been taught in many of them, still they have in nearly every instance done better in this respect than their neighboring colleges.

Permit me now to discuss directly the question "What are the Demands Made by Horticulture upon the Science of Botany."

I. NOMENCLATURE AND CLASSIFICATION.

It demands of it a nomenclature and a classification of the plants of the farm and garden including not only the cultivated plants but all those which, in one way or another, are of interest to the horticulturist. I say it demands such a nomenclature and classification, but how far is this demand honored? How much does ordinary botany do in furnishing nomenclature and classification for wheat, oats and Indian corn; for apples, pears, peaches and cherries; for our roses, geraniums and verbenas,—in fact, for all the plants which have run into many varieties? What the student learns as to a specimen of wheat, for example, is that its name is *Triticum vulgare*, and that it is a member of the order *Gramineæ*. In the proper botany of the schools there is absolutely nothing further furnished as to the nomenclature, and little more as to classification. It is the same with Indian corn. The student may have in hand popcorn, sweet corn, flint corn, dent corn, and even husk corn, and yet the science of botany gives him but one name—each one is ticketed *Zea mays*, of the order *Gramineæ*. So it is with every other cultivated plant.

Now, I ask, is this an adequate nomenclature? Is it, in fact, worth our while to study botany if this is all it can do for horticulture? I put my query in this form because some people still hold that the supplying of a nomenclature and classification is the great purpose of botanical study in so far as it is related to agriculture and horticulture.

I hold that it is the duty of the botanists to furnish a classification and a nomenclature to agriculture and horticulture, and I look with great interest upon the efforts which have been made by botanists here and there to classify and name the varieties of some of the cultivated plants. The attempt by Professor Beal to classify the apples by taking into account the floral characters, and the later attempt by Dr. Sturtevant to work out a classification of Indian corn, are efforts in the right direction. It is said by some that the consideration of cultivated plants lies outside of the domain of botany. But, if botany is the science of plants, how can a plant ever, by any amount of variation, pass beyond its domain? Who shall say that science must stop at this or that line? Can the mere accident of modification through cultivation take a plant out of the botanist's jurisdiction, when modification through what we term natural agencies does not? *All plants*, in *all states* and under *all conditions*, should legitimately be included within the domain of botany.

II. VEGETABLE PHYSIOLOGY.

Horticulture demands of botany a knowledge of the physiology of the plants of the farm and garden. It demands, first of all, that science

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shall throw light upon the processes of growth and nutrition. Every question concerned with the taking of food by the plant, the method of using it, its effect upon the stem, leaf and fruit, must be answered by botany, if it is to command the respect of the practical men of the agricultural world. A great part of the success of the horticulturist is dependant upon the perfect growth and nutrition of the plants he cultivates. And his success is greater the more closely he is enabled to bring about and maintain those conditions which are most favorable to such growth and nutrition. But how can he intelligently work for these conditions if he does not know them? And how can he know them if the very science which professes to include the study of all plants can give him no aid?

Any presentation of botany which leaves out a full discussion of the growth and nutrition of plants, in so far fails of being useful to the horticulturist.

Then there is the whole subject of reproduction, which is of great importance and value to the horticulturist in these days when our horticultural literature is filled with discussions upon fertilization, cross breeding, heredity, etc. Botany must present these topics with as much of clearness as possible. Every full course of study in botany should include a particular discussion of the mechanism of fertilization in its widest sense. Modern horticulture demands satisfactory answers to the questions: How are the cultivated plants naturally fertilized? How can their fertilization be controlled? How can cross-fertilization be effected? What are the laws of hybridization? In how many instances can the teacher of botany give a reply to these queries? I fear that the horticulturist in quest of knowledge upon these botanical points will have to turn sadly away from most of the lecture-rooms and botanical laboratories of our colleges.

So, too, the discussion of everything pertaining to the germination of seeds falls properly within the domain of botany. There are few things more important than that of germination; but, excepting a short and summary discussion, — and withal a very general one, — but little attention is given to the subject in ordinary courses of study in colleges.

Last under this head, I would call attention to the need of a study and discussion of the physiology of the cultivation and improvement of plants. What is it that takes place in the structure of a plant when we bring it under cultivation? What are the differences between a wild plant and the same plant under domestication? How do the changes due to cultivation arise? What laws control these questions? Is there a limit to these changes? These are a few of the changes which agriculture and horticulture are asking of botany, but which, alas! are not as yet satisfactorily answered.

III. VEGETABLE PATHOLOGY.

In the third place, horticulture demands of botany a knowledge of the pathology of vegetation. It is not enough that the normal action of all parts of the plant should be understood; the abnormal and diseased actions must also be considered. Unfortunately, the world is full of accidents, of noisome gases, of poisonous liquids, of freezing or scorching temperatures, of harm-

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ful insects and of destructive fungi. The plant which is more or less affected by one or all of these is not the normal plant of the vegetable physiologist. The vegetable pathologist must build his science upon that of his fellow worker in vegetable physiology, and the results of the labor of both must be laid before modern agriculture for its use. That botany which hopes to satisfy the demands of the advanced horticulture of to-day must include a knowledge of pathology.

DISCUSSION.

C. L. Watrous: It takes a brave man to say anything about a paper written by Professor Bessey. Professor Bessey has written a paper for our Society annually for several years. He has done more to bring the science of botany up to the demands of horticulture than any other man. If all botanists would do as he has done, we would get much more light on such subjects. If he has not brought out the knowledge, he has suggested the means. A great deal of the good we have derived has grown out of such papers as Professor Bessey and others have written. They study deeper into such things, and it is a misfortune to Iowa horticulturists that Professor Bessey has been allowed to go to Nebraska. Hope he will continue to send us a paper every year.

R. P. Speer: I learned a great deal from Professor Bessey. Professor Halstead is doing a great work. He read a paper at our institute lately. The particular kind of work he is now giving attention to is in our line of work.

H. W. Lathrop: There are varieties of apples all over our State that are of great value to horticulturists. If horticulturists do not gather them up these varieties will slumber on indefinitely. We should make some effort to gather them up. The Ishiewood is a winter apple of promise. It is a stray from the East. It is a promising variety, and should have an extended trial.

J. Wragg: I learn that a certain party is trying to make a corner on it. I would like to know more about the Black Annette.

H. Strohen: I know but little about it from personal knowledge, but east of us they are doing well.

G. B. Brackett: I think Mr. Lathrop's remarks are right to the point. Some of these varieties have passed through the past test winters. The Hawthorndon apple is doing well. At Mr. Fluke's place I saw limbs as big as my arm, cut off and the trees are doing well and are healing over. It bears well and is perfectly hardy. I took

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some of them to the American Pomological Society, and they decided that it was the true Scotch Hawthorndon.

I also investigated the Virginia Crab. The "Virginia" does not belong to it at all. Think the idea of looking up fruits one of the best that has been advanced.

C. L. Watrous: As to Black Annette, I have a letter from Mr. Bransen who says that he has sent that variety among others, to be entered here for a premium. So the fruit can be seen as soon as I can get them from the express office.

J. Thatcher: Mr. Lathrop says the Fameuse is hardy. We used to consider it an ironclad, but it is not hardy with me.

G. B. Brackett: With me it is perfectly hardy. I would not do without it at all. It will grow anywhere.

M. C. Staves: In Harrison, Shelby, and generally in western counties of the State, in prairie orchards, it fails to give satisfaction.

President Patten: In Floyd county it was one of the last of the old varieties to yield to the pressure. Three years ago the last of them went out, at an age, some of them, of twenty-five years. A variety that has done as well and lasted as long, we should be slow to discard. I think we are entering upon an era of important discussion of new and desirable varieties. I visited Mr. Fluke's orchard last summer, and found the Hawthorndon nearly as perfect as the Duchess. Also the Virginia Crab, which is hardy all over Dakota.

G. B. Brackett: Suel Foster sent east and got this variety as Virginia crab, and it has been sent out as Virginia crab, but it is not that variety. Mr. Fluke's soil is prairie soil.

N. T. Case: We often get tangled in nomenclature, but in the Fameuse we cannot account for the difference in the reports that way. So we must ask for the conditions and circumstances. I have had some remarkable observations in that line. The Maiden Blush has done well, and we used to think it tender, while some supposed hardy varieties have failed; we should know the ifs and ifs, before we can come to an intelligent conclusion.

Geo. Van Houten: The Black Annette does well in our county, but it is too small to become a popular market apple. It keeps well and is valuable for home use.

The Fameuse does well generally over a large portion of the state, while it blights and even fails in places. Willow is worthless with me, blights to death, yet in our county, in certain orchards, it heads the list for profit. In choosing varieties, it is usually safe to set

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such varieties as are known to succeed in the locality. In most parts of the state, especially in the south-western portion, enough is known of success and failure, to be a fair guide to those desiring to plant. It is safer to plant of best known kinds than risk unknown varieties.

C. L. Watrous: Here, near Des Moines, are trees of Fameuse, Cole's Quince, Kirkbridge, White and Willow, that are doing well. There are differences that cannot be observed; we must not jump at conclusions.

E. F. Edmunson: If trees are injured when one or two years old, they are most sure to die before they are twelve years old.

N. T. Case: The fact of a tree being unhealthy is not always easily determined. There is a disease at the roots of our trees that pervades all the nursery stock all over, so far as I know, and the decision of the whole matter is right there. Some will have it that trees winter kill, others, that it is the variety, and some something else; but the disease at the root, whether fungus or insect, or whatever it is, is the real trouble.

Motion by Col. Brackett, that we appoint a committee to memorialize the Legislature, asking them to give us power to change the time of holding our annual meeting. The weather is generally cold about this time, besides our secretary could have more time to get our report out, and have it in time for spring planting.

John Wragg: I am glad this subject has been brought up. A great many people would like to have the advantage of the report in the following spring planting.

After further discussion the motion was withdrawn, and the society adjourned until 2 o'clock.

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AFTERNOON SESSION--FIRST DAY.

A paper on cross breeding of plants, was read by John Craig, as follows:

CROSS BREEDING.

BY JOHN CRAIG, AMES, IOWA.

To the cultivators of ornamental plants, says Mr. Herbert, the facility of raising hybrid varieties affords an endless source of interest and amusement. He sees in the several species of each genus, that he possesses the material with which he must work and he considers in what manner he can blend them to the best advantage, looking to the several gifts in which each excels, whether of hardiness to endure our seasons, of brilliancy in its colors, of delicacy in its markings, of fragrance, or stature, or profusion of blossom.

In the many successful attempts made by Mr. Knight to improve the quality of fruit trees by raising new varieties, his method was to obtain cross breds by fertilizing the stigma of one variety of known habits with the pollen of another, also of known habits. But in doing this his experiments were not conducted at random and not without due consideration; on the contrary we learn from himself that he was very careful in selecting the parents from which his cross-breds were obtained. He tells us that he usually propagated from the seeds of such varieties as are sufficiently hardy to bear and ripen their fruit even in unfavorable seasons and situations, because in many experiments made with a view to ascertaining the comparative influence of the male and female on their offspring, he had observed in fruits, with few exceptions, a strong prevalence of the constitution and habits of the female parent. Unfortunately, however, this is precisely the reverse of the result at which Mr. Herbert has arrived in the very great number of experiments performed by himself on that subject. He believing the male parent generally influences the character of the foliage and the female that of the flowers, and although it does appear to me that in the majority of cases Mr. Herbert's opinion is the more correct of the two, yet

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I fear there is too little certainty in the results of hybridizing to justify the establishment of any axiom upon the subject.

The power of hybridizing is confined within narrow limits in comparison with cross-fertilization. The first can hardly be said to exist at all between species of different genera, while on the other hand, cross fertilization takes place quite as readily among plants as among animals, and it is difficult to estimate the alteration this process has already produced, although unperceived by us, in the amelioration and improvement of long cultivated plants. We cannot reasonably doubt that a process as simple as that of dusting the stigma of one plant with pollen of another, which must be continually happening in our gardens either through the agency of insects or the currents in the air, and which, when it takes place between two varieties allied to each other must necessarily produce a cross—we cannot suppose I say that this occurs in our crowded gardens at that time only when we perform it artificially.

It may be said that the art of breeding consists in changing the conditions of life and regulating the reproduction of animals and plants. Since a breed is a domestic variety it implies the existence of a group of individuals marked off from their congenees by the possession of certain characteristics which are transmitted to their offspring. It is this transmission of peculiarities which is the essential characteristic of a breed, for any collection of domesticated organisms could be divided into groups of individuals distinguished by certain points, but such groups would not necessarily form breeds. It is evident then that the law of heredity which asserts that "like begets like," must hold good, or the existence of breeds will be an impossibility. Again, if it were absolutely true that "like begets like," that is, if the offspring were in all cases identical with the parent, it is evident that neither by man's interference nor by the operation of nature could a breed or race arise. It seems then that were it not in the nature of all organic beings to reproduce their kind in the manner formulated in the principle of heredity, and were it not for the continual slight infringement of expressed laws by the principle of variability, breeds could not have arisen. It is therefore, necessary to examine these two principles as part of the subject under consideration.

Whatever views we may entertain respecting the origin of our domestic animals and plants there can be no doubt as to the matter of fact that breeders have always proceeded on one principle—select the best individuals in each generation and pair them.

Now we will find that the qualities of organic beings can be generalized under two principles—heredity and variability; and in the same way the art of breeding is itself capable of a kind of generalization under the principle of selection. There are, thus, three great principles or laws—*Heredity, Variability* and *Selection;* the last relating to the art of man, the other two to those qualities of organic beings which render the art practicable.

Variability.—A mass of evidence exists showing that variations of every conceivable kind occur among the offsprings of all plants, and that in particular constitutional variation are by no means uncommon. Among cul-

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tivated plants for example hardier and more tender varieties often arise. How well this is shown in the fruit trees of North America, and even in so restricted a portion of country as Iowa. Adaptation of this kind is sometimes very close so that for example few English varieties of wheat thrive in Scotland. In Italy as long as orange trees were propagated by grafts they were tender, but after many of the trees were destroyed by severe frosts, plants were raised from seed and these were found to be hardier and more productive than the former kinds. When plants are raised from seed in large quantities variations always occur differing in constitution as well as others differing in form or color; many examples of this might be given from Darwin and others. A very striking example is found in Chinese History. Mons. Huc, in his L'Empire Chinois, gives the following extract from memories of the Emperor Khang. "On the first day of the 6th moon I was walking in some fields where rice had been sown to be ready for the harvest in the 9th moon. I observed by chance a stalk of rice which was already in ear. It was higher than all the rest and was ripened enough to be gathered. I ordered it to be brought to me. The grain was very fine and well grown which gave me the idea to keep it for trial and see if the following year would preserve its precocity. It did so. All the stocks which came from it showed ear before the usual time, and were ripe in the 5th moon. Each year has multiplied the produce of the preceding, and for thirty years it is this rice which has served at my table. It is the only sort which can ripen north of the Great Wall, where the winter ends late and begins early, but in the southern provinces where the climate is milder and the land more fertile, two harvests a year may be obtained; and it is for me a sweet reflection to have procured this advantage for my children." Mons. Huc adds his testimony that his rice flourishes in Mandtchurica where no other will grow. We have here, therefore a perfect example of acclimitization by means of a spontaneous constitutional variation.

Adaptation by variation would, however, be a slow, uncertain process, and might for a considerable period of time cease to act did not *heredity* come into play. This is the tendency of every organ to produce its like, or more exactly to produce a set of new forms varying slightly from it in many directions — a group of which the parent form is the centre. If now one of the most extremes of these variations be taken, it is found to become the centre of a new set of variations, and by continually taking the extremes in the same direction and increasing variations in that direction may be effected, until coming so great that it interferes with the healthy action of the organization, or is in any other way prejudicial. It is also found that acquired constitutional peculiarities are equally hereditary, so that by a combination of these two modes of variations any desired adaptation may be effected with greater rapidity.

We may now take it as an established fact that varieties of plants occur in a state of nature which are better or worse adapted to special climates. There is no positive evidence that the influence of mere climatical conditions on the parents has any tendency to produce variation in the offspring better adapted to such conditions, although some of the facts already men-

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tioned render it probable that such may be the case, neither does it appear that this class of variations are very frequent. It is, however, certain that whenever any animal or plant is largely propagated, constitutional variations will arise, and some of these will be better adapted to the climatal and other conditions of the locality. In a state of nature every recurring severe winter or otherwise unfavorable season weeds out these individuals of tender constitution or imperfect structure, which may have got on very well during favorable years, and it is thus that the adaptation of a species to the climate in which it has to exist is kept up. Under domestication the same thing occurs by what Mr. Darwin has called unconscious selection. Each cultivator seeks out the kind of plants best suited to his soil and climate and rejects those which are tender or otherwise unsuitable.

The farmer breeds from such of his stock as he finds thrives best with him and gets rid of those which suffer from cold, damp or disease. A more or less close adaptation to local surroundings is thus brought about, and breeds or races are produced which are sometimes liable to deterioration on removal even to a short distance in the same country.

PURPOSES OF CROSS-FERTILIZATION.

The results sought in cross-fertilization of varieties, or the hybridization of species are various, but the principal one is to produce something different from either parent. Sometimes we may aim to increase the size or change the color, texture, flavor or other characteristic of a fruit, or the size, form and color of a flower or habit of a plant. Adaptation of the various species and varieties of cultivated plants, to specific conditions, is another and often very important object sought in producing cross-bred plants. There are many species and occasionally varieties which have been so closely inbred in their native habitats or elsewhere, that they have acquired a fixedness of character that removals to other localities and subjection to widely different conditions fail to effect any material change in their offspring, but by crossing and the introduction of new sexual or other elements, the foundation of generations, as it may be termed, is broken up, and wider deviation from normal types soon follow. It may sometimes be necessary to introduce an undesirable element in order to force a plant to break away from its typical form, but when we have succeeded in this it will not be difficult to breed out the undesirable characteristics or properties. Then again we cannot know in advance what will be the result of crossing any two plants of the same genus or species, for even the mingling of two inferior elements may result in the production of one superior to either of the originals. Still we would not advise using inferior materials in preference to superior, except when it is absolutely necessary to effect a desired variation, as may sometimes occur when a person has but a limited number of species or varieties of a genus with which to experiment. A wilding may possess some very desirable properties, such as vigor, hardiness and exemption from disease, while its domesticated congener lacks one or all of these properties; so by combining the best elements of the two a new and superior progeny may be produced.

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We may among fruits, secure size, color, texture, in fact all the good qualities known to belong to or exist in a certain species and still these will be of little value unless the plant itself is adapted to the soil and climate where it is to be cultivated. One variety of the plant may be more hardy and safely endure many degrees lower temperature than another of the same species, but no amount of nursing or moving about will ever change a tender plant into a hardy one. But by introducing new elements as in cross fertilization we multiply the causes for wide variation through the different hereditary characteristics of both parents.

Plants that are indigenous or have become naturalized in cold climates and in elevated regions are constantly subjected to the loss of their leading shoots and branches through the action of frosts and winds, and this being repeated for centuries in succession the plants at last become permanently dwarfed, and this character becomes fixed and hereditary, as seen in many of our cultivated plants obtained from cold or alpine regions. The dwarf habit remains fixed in the individual even when cultivated in more favorable regions, but so soon as we commence to raise seedlings from these pigmies we find that there is a tendency in certain individuals to grow taller than the parent plant, or return to what we may presume was the original form of the species.

Why the seeds from a plant should yield both tender and hardy varieties can only be accounted for upon the hypothesis that each possesses hereditary transmitted characteristics, but what the nature of the laws are that control this transmission we know little or nothing. We can form no conception why the advantage from a cross is directed exclusively to the vegetative system and sometimes to the reproductive system, but commonly to both. It is equally inconceivable why some individuals of the same species should be sterile while others are fully fertile with their own pollen. Why a change of climate should either lessen or increase the sterility of self fertile species, and why the individuals of some species should be even more fertile with pollen from a distinct species than with their own pollen and so it is with many other facts which are so obscure that we stand in awe before the mystery of life.

When agriculture and horticulture shall have been long enough to school to the natural sciences, and under more direct encouragement from the state, shall have taken its true rank among the pursuits of man, keeping pace with the progress of the world, and holding its own against the aggressions of every other interest, perhaps no art of all those which they will make contributory to their use will do them greater service, than the subject of this paper. Then cross-fertilization and hybridization in the hands of those who will devote their lives to its study and practice, will be in constant requisition, to furnish the cultivator in field, garden and forest, such plants as will best supply his wants or gratify his fancy. Instead of being employed as now by a few scattered experimenters and very much as we handle some magic toy to amuse or astonish us by its brilliant display, it will in that day be practiced systematically to produce sure and definite results. None of the higher order of plants upon the cultivation of which

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man bestows any attention whatever, but will be made to feel its potent influence. Fruits and vegetables, flowering and foliage plants, cereals and grasses, herbs, shrubs, and trees, everything from the tiny growth that contents itself with a three inch pot up to the monarch of the mountain forest, all these myriad vegetable forms, lying plastic as clay in the hands of the experimenter, shall be made to exhibit manifold variations never before seen and not as yet conceived of the qualifications of the hybridist. Mr. Darwin says: "Indomitable patience, the finest powers of discrimination and sound judgment must be experienced during many years. Of the field before him Dr. Lindly testifies: "We have but stepped over the borders, and the whole field of hybridizing lies widely open before us; its boundaries are lost in the horizon, and we shall find them ever receding as we advance."

The last injunction of that veteran in pomology, the late Marshall P. Wilder, should ever remain with us and be our watchword in our efforts towards the production of new and hardy fruits. "Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties and as a shorter process ensuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence."

DISCUSSION.

R. P. Speer: I want to say a few words on the subject of the paper just read. It is a subject I have given much attention to. The paper is just such a one as I like to have read. I do not want to criticise, but to *emphasize*. The subject came up while we were coming up to this session this afternoon. The question is, as to whether hardiness in the tree is produced by the male or female parent. If it does not make any difference which is the hardy parent, we can get pollen from the hardy varieties in Canada or Vermont, and cross on our Janet or other common varieties. I have found that in breeding animals that the nearest thoroughbred is most prepotent. If the female is most vigorous, she is prepotent; if the male is most vigorous he will mark the offspring.

If it makes no difference, and I do not believe it does, as the principle is the same in breeding animals and plants, it makes no difference which is the hardy parent.

H. W. Lathrop: In cross-breeding we expect to fix the progeny from the one having the most fixed type. I have had a good chance to see the result of crossing the Red Polled and the Short-horn cattle. The red color is a fixed type in the Poll; while the Short-horns are red, white, roan or spotted. The form of the Short-horn is one of the fixed characteristics of that breed; so in the offspring we get red cattle without horns, yet they retain the desirable form of the Short

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horns. Whatever is a fixed type in an animal or plant we may expect to appear in the offspring.

C. L. Watrous: If we use grafted stocks of either our native or Russian varieties, it is hard to tell what we will get, or which is the most fixed in their habits. Most of our varieties are chance seedlings that proved themselves good, and have been disseminated. The Russians are the same, or have been grown in the same way, I suppose; so that we have no data from which to judge, so that so far as that goes we are at sea. Now another principle; we should breed from the very best we have. If we had no Russians—and I am not going to say anything about them in this connection—but if we have not got them we should not withhold our hand. Most of our apples are from chance seedlings, and so much has been gained in that direction, that we should take courage and go to work systematically to get varieties suited to our needs. We cannot tell which will bring the best results for our prairie planting, so that it is not necessary to get seed only of varieties from northern Europe or Russia, or even a cross from them; as proper management with those we now have promise better results. They have been propagated under conditions somewhat similar to present surroundings. What the Russians will do under conditions and surroundings here cannot be told. If seeds are gathered from trees we now have, and planted bountifully, and we ask the blessings of Providence on the work we may expect good results. In the paper we have heard read the principles are laid down, and with that knowledge we can get material for abundant experiment, and there is great ground for hope.

R. P. Speer: Another matter I wish to bring up. The question of producing hardy varieties from seed. Mr. Peffer, of Wisconsin, has stated that every time you produce a tree from seed in Iowa or Minnesota you can take it one degree north. In winter of 1855–56, there were twenty-eight days that mercury never got above 25 degrees below zero; and a good deal of that time the mercury was frozen. If we had taken seed from the trees that survived that winter, we would have had trees that would stand the cold; but would they have been adapted to the years that followed? It is reasonable to suppose that if the trees had been re-produced four times since 1856, that they could have been removed four degrees further north. In the winter of 1872-3, we had trees root-killed from drouth. We must breed for characteristics that will endure drouth, dry atmosphere and cold. If we take seeds when trees are suffering, nature will help.

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C. L. Watrous: Whether seeds gathered after an extremely dry season will produce trees better calculated to stand drouth remains to be seen. I remember many years ago hearing a lecture by Bayard Taylor. He described the scenes through which he passed so vividly that I could almost see the dogs and sleds. He said that when he decided to make the trip north he was enduring intense heat, and reasoned that the same requirements would enable him to stand the cold; and he found it so. When in Norway he found that the vigorous constitution required to endure the heat enabled him to stand the cold. Heat and cold is part of our climate—we simply don't know just what kills our trees. If we select any of the seeds grown here we usually breed trees that will stand some of these conditions. There is no other climate just like ours; others are as cold, others as hot, but none just like it; but if we select seed from trees here we will produce offspring with characteristics just suited to our climate. We have nut-bearing trees, hickory, white and black walnut, hazel and many other varieties, and we have been too slow to propagate of the best and seek to make improvement.

N. T. Case: In referring to similarity between animals and plants the condition the parents are in should be considered. If a tree has gone through a severe winter, the seed would be more likely to produce trees that would endure our climate, on the same principle that if the animal has been at hard labor the offspring is more apt to be healthy.

J. M. Elder: I think the best part of the paper and discussions are those parts that show that we must find out by experience.

J. C. Plumb: I think we are feeling for facts. We know but little about it. I made a statement at one of our institutes that we have not a single variety that is not the result of accident. My friend Speer talks of getting seeds from a variety after a hard winter, with the expectation of getting hardy trees. This has been going on for two hundred years in New England and elsewhere. Near Geneva, N. Y., is an old Indian orchard over one hundred years old. If each generation would go one degree north we would have had apples that would grow at the North Pole by this time. As to which transmits hardiness—male or female—there is very little known. Since 1848, every year, seeds of Siberian crabs have been planted in Wisconsin. They fruited very soon, and from the thousands and tens of thousands of seedlings not one is worthy. They are not worth anything. In 1848 from seed of Fall Stripe, if fertilized, by a Siberian crab, a

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large number of valuable seedlings have been obtained and sent out. One kept through the winter. We thought it an iron-clad, but it proved only as hardy as Plumb's Cider and went out. We want to plant seeds of a good fair sized apple of good quality, with a cross for hardiness.

President Patten: I believe Mr. Plumb has given us a practical demonstration as to whether it is possible to get hardy varieties by cross fertilization. We have had it taught here in Iowa that the female has had more influence on product as to hardiness than the male. One variety obtained by accident shows this principal: the Briar's Sweet from Cherry Crab beside Baily Sweet. We have other experience. Seed from Siberian Transcedent and Hyslop have been planted largely, but not an apple of two or three hundred are valuable. I have planted seeds of Siberians that must have been fertilized with good varieties, yet without good results. I have one, a hybrid that promises to be valuable to cross varieties of good quality on. It is larger than Transcendent. It is Russett. From this I have a fair sized apple that is twenty per cent hardier than Duchess. The hybrid was surrounded with good apples, such as Grimes, Russett and Tallman Sweet. I do not consider it chance if we plant seeds from a Duchess with other trees like Russett, Grimes' Golden and Tallman Sweet growing within twenty feet of it. This is not a chance but a judicious selection. The Siberian with its strong characteristics is prepotent and overcomes the good qualities of our good kinds, but if we begin with a hybrid, these characteristics are not so strong, and the good variety has a chance to be prepotent and mark the variety with its good qualities.

John Wragg read a paper on Ornamentation of Country Homes.

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ORNAMENTATION OF COUNTRY HOMES.

BY JOHN WRAGG.

The ornamentation of country homes by the planting of trees, shrubs and flowers; by the laying out of drives and walks; by the terrace and gentle slope; and by all that is included in that art "which doth mend nature," must be made subject to so many conditions, such as size of grounds, direction of exposure, slope, if any, of ground and elevation, that it is not possible to form any rule that is applicable to all, or even to but very few. I have supposed that it was the intention of the committee who assigned me this subject that the paper should be of such a character as to be a help to our farmers in adding to, and ornamenting the homes already begun, and for a guide, slight though it may be, to those who anticipate the building, planting and keeping of what must be a life work — a beautiful country home. Iowa country homes have been heretofore largely built when, how and where the purse of the owner and his judgment in regard to the necessities of the farm indicated; generally on or near a public thoroughfare; sometimes before the highways had been located, but always where an abundant supply of water could be obtained for house and stock. Sooner or later this is changed. Roads have been laid out, school-houses and churches have been built. Towns have sprung up, called into existence by the needs of the country; sometimes located on the nearest railroad, and often being the means of bringing the road to them. With this change in the country comes a change of the home makers, and a change for the better in the ability of many of them to make homes where they may enjoy to the fullest extent the fruit of their labor.

The home should be established near the highway and on such part of the farm, if possible, as faces the east or south, so that belts of trees for shelter can be planted north and west to break the force of both winter and summer storms. The grounds should be of such size as corresponds somewhat with the size of the farm and dwelling. They should lie and extend both south and east of the house wherever possible. The barns, other outbuildings and yards for stock should be back, or if at one side, far enough to be partially hid by a living screen of some close-growing variety of evergreens. This of itself may be made one of the most attractive features if well grown and cared for. One of the most important features both for comfort and protection, and also to show off the home and grounds to the best advantage, is a background of the larger and faster-growing evergreens. These must be immediately behind the dwelling and extend in wings so far and in such shape on each side as the nature of the ground, the principal points of

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view and the taste of those most concerned shall designate. The best trees for this are one or two rows of pine, Scotch, white or red, and one row of spruce on the inside next to the dwelling, either of Norway or white.

A main drive should be laid out in gentle curves, if possible, and walks to suit the convenience of house and grounds. These should be established before many trees are planted; and only a few trees should be planted unless the grounds are very large. In large grounds nothing is more attractive than groups of trees naturally and tastefully planted as regards their size, color and general characteristics. Downing in his "Landscape Gardening" says: "Nothing at first thought would appear easier than to arrange a few trees in the form of a natural and beautiful group; and nothing really is easier to the practiced hand. Yet experience has taught us that the generality of persons in commencing their first essays in ornamental planting almost invariably crowd their trees into a close, regular clump." The angles at the intersections of walks and drives should be planted with small or medium sized trees. Of deciduous trees the best are cut leaf birch, *Oleaster Virgilia*, and *Caragana;* of evergreens the *Siberian arbor vitæ* and hemlock for dark and persistent color; and for the glaucus or silvery leafed, the *menzies spruce* and selected specimens of white spruces. When a large and symmetrical tree is desired, the cucumber magnolia and *bolleana poplar* are the best representatives of their respective classes; the first a dark green, and the latter said by Sargent to be the "most magificent silvery leafed tree of the temperate zone." Our native hard maple and white elm should not be neglected, but if the best effect is desired they must have plenty of room; and the light and graceful larch should have a place in every collection.

The best of our hardy flowering shrubs as regards beauty of bloom, time of flowering and colors should be so planted as to add to the artistic effect as a whole—and not by overcrowding detract from the beauty of any particular place. Our hardy climbers, honeysuckle, wisteria and ampolopsis, may be used to cover any place that might otherwise be unsightly. A fine effect may be produced by planting Canna, hollyhocks, some of the showiest of the *ricinus* or castor bean—in fact any large growing plants that are striking, as regards either foliage or flowers, against a background of close growing evergreens.

I cannot conclude this paper better than by quoting from Bayard Taylor. He says: "Plant a tree and it will take of itself it own characteristics. Nature however can simply produce; she cannot combine and arrange. She will not plant yonder weeping ash on the slope, so that its outer branches just touch the water; she will not rear those purple birches to relieve the huge green masses of the ancient Lindens, nor give the Silver birch an airy lightness and distinctness by a background of pine. She plants weeds among the flowers and ripple grass in the turf; muffles the brook with autumn leaves, and fills the pond with sickly water mosses. The intelligent landscape gardener arranges his trees with regard to their forms and tints, to the light they catch and the shadows they cast, until they stand as far in beauty above the uncultured woods as the pediment groups of Grecian temples are above a group of ordinary men. He sees like the

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sculptor the suggestions of Nature, and pilfers the graces of a hundred forms to blend them harmoniously in one ideal."

DISCUSSION.

J. C. Plumb: I would like to ask Mr. Wragg if the yellow wood, *magnolia acuminata* is hardy here?

John Wragg: Yes, it is hardy in latitude of Des Moines.

J. C. Plumb: Has any one had any experience with Japan form of ampelopsis?

G. B. Brackett: It is not hardy here. It does not grow up in tree form, but runs off like a vine.

C. L. Watrous: It wants a moist climate. I have had it here in nursery, but have not been able to keep it in open ground. We must make a broad distinction between maritime and interior plants. This has often more to do with success of plants than latitude.

John Wragg: *Populus boleana* is a very nice tree. It does not sprout from the roots like the silver leaf poplar. It is hard to propagate, as it does not grow from cuttings like the other poplars.

N. T. Case: I would like to know if all the poplars from the college farm are of the sprouting kinds?

President Patten: Mr. Wragg has just told us that they do not all sprout.

N. T. Case: The Lombardy poplar will not sprout if the roots are not broken.

President Patten delivered his annual address as follows:

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THE PRESIDENT'S ANNUAL ADDRESS.

Members and Friends of the State Horticultural Society:

Could I greet you with one half of your reasonable and well defined hopes, realized in the field of horticulture, I could address you with greater pleasure and more confidence; but custom requires that I should present on this occasion, some thoughts bearing upon our work; and in doing so I am reminded that I am speaking to some who have devoted the best part of their lives to this "that and doth," so beautifully "mend nature," and that therefore I can be expected to say but little if anything that will be new to them.

It is said, and felt too-with too much force, that we have fallen upon a discouraging era in horticulture, but it may be if we would examine critically all the factors that are at work, both for and against us, we would find, that after all the conditions are not so bad as they seem. It may be that the thought and effort, the vexations and losses and disappointments and delays, are after all the crucible that shall so refine and sharpen our intellects, that the results in beautiful fruits and trees and flowers, will far more than compensate for all the losses and trials, that we have sustained. True it is, that our trees and fruits for the past few years have been sifted as by fire; and already the gold of the refining process is beginning to appear; the foundation of a lasting horticulture are being laid, and we can predict with confident assurance, a grand future for our State in the adornment of our home and public grounds with stately and graceful trees, and our gardens and orchards with fragrant and beautiful shrubs and flowers, and delicious and enduring fruits.

Aside from the health and wealth that our pursuit brings to a people, it also is a civilizing agency, than which there are few that contribute in a greater degree to intellectual strength, purity and moral greatness. Other practical influences that tend toward culture and refinement, and the true progress of the state, that goes out with the oftentimes humble employes of the garden, the Green House and the Nursery is, I am sure not receiving that recognition that its merits deserve. Who can doubt, that the more numerous the homes that are fully supplied with the delicacies of the garden and orchard; and that are made attractive and endearing by beautiful surroundings, that the State will not be richer in the patriotic pride and devotion of its citizens, and more secure in the permanence of its peace and prosperity.

A brief review of what has been done, and what we are doing, may serve to encourage if not to satisfy us with our present condition.

Fortunate indeed it is for the cause of horticulture, that the fruits of the early settlers of eastern Iowa and eastern Wisconsin, were not destroyed as

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have been ours, before they had demonstrated that many varieties of fruits could be grown. Had they been so destroyed, the loss to the northwest would have been almost irreparable.

Animated and stimulated by their success prior to the severe winter of 1855-6 they were unable to rally and again demonstrate the practicability of growing a large variety of fruits. The Wisconsin list of recommended grapes was, twenty-eight years ago, Isabella, Clinton, Concord and Vermont. Now we have Concord, Worden, Janesville, the Elegant Lady, the popular Moore's Early and others, and the promise of still others, that are likely to displace even some of these valuable varieties.

Of blackberries they had none except the Lawton; now we have Snyder, Stone's Hardy, Barnard and Britain, and by the improved method of soil covering can grow them in abundance everywhere in the northwest.

Then they had Early Scarlet, Hovey and Wilson strawberries, now we have Wilson, Green Prolific, Manchester, Sharpless, Red Jacket, May King, Windsor Chief and Jessie; and the Crescent that out ranks in popularity all other known varieties. Of raspberries then, the Purple Cane, the only one of their list that is now recommended in our catalogues. Now we have Cluster, Tyler, Gregg, Souhegan, Cuthbert and others that are meritorious, besides the excellent and hardy Turner. In currants we have added Victoria, the prince of the red varieties; while in cherries there is but little change, but prospectively we are advancing.

In place of their plums, that have all perished, we are rapidly developing a new race, having perfect adaptation and excellent quality.

In nearly every thing except apples and pears we have made noteworthy advancement, and in the matter of hardiness we undoubtedly have surpassed them.

But we have done more, far more, we have brought together the hardiest forms and varieties of the apple known to Europe, Asia and America, and I believe I speak advisedly when I add pears also.

We have also imported the hardiest varieties and forms of ornamental shrubs and trees.

We have brought to light our own beautiful and enduring white Spruce, and the surpassingly beautiful Abies Pungens, the silver Spruce of the Rocky mountains; but space forbids further mention of shrubs and trees and flowers, but I cannot refrain from mentioning the graceful and elegant cut-leaved weeping birch, and the scarcely less attractive European white.

We have established an extensive system of trial stations, have offered large premiums for the origination of new fruits adapted to our climate, and have entered upon an era of practical and scientific research, and are seeking for causes as well as results. We are crossing and hybridizing the hardiest varieties and species for better adaptation, and are grounded in the conviction that certain plants, like animals, have an inherent tendency to produce superior offsprings, and that the fittest of one generation become the progenitors of the superior offspring of the next.

In our own State and elsewhere the good results of a critical analysis of

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the situation are beginning to be seen. One man alone has about three thousand seedling grapes of the hardiest and best parentage. Another in Wisconsin has fifteen hundred two and three year seedlings of the Longfield and Good Peasant. Another in Minnesota has some two hundred two year seedlings of Ostracoff's Glass and Hibernal, that he believes were cross-fertilized with the Wealthy.

The wild race of crab-apples has at last been broken into and is ready to respond to our skill with whatever of value there is in it. But rising above all these examples is the crowning fact that horticulture with us is becoming every day more of a science. In every department of our work and to every problem there is being applied a keen, searching inquiry that has had no parallel in our history.

The extensive work at our chief station at Ames is being supplemented by the intelligent activity of a host of practical experimentors all over the State, so that Iowa is in truth becoming one grand experimental station.

With such a prospect, where are the reasons for repining? If there are reasons they are like the faint rays of the eastern twilight compared to the full-orbed hope that is lighting us on to grander achievements of horticultural beauty and utility.

MEMBERSHIP.

In comparing the reports of 1876 and 1886 we find an increase of membership to the number of sixty, a falling off, however, from 1881 of more than thirty members, reaching at the later date 194 members. I call the attention of the society to these facts for the purpose of inquiring whether some means cannot be devised to add in the next three years at least 150 members to our list. Such a result is most desirable, and I would suggest as a means for the accomplishment of this object that you delegate to some one who shall by correspondence or otherwise ascertain the most desirable places for the organization of local societies to the number of ten or more, or restricted only by the amount of funds that you shall deem best to appropriate for this purpose, which need not be large. Horticulture is becoming more diversified; the population of our towns and cities and those adjacent to our State is increasing. The interest in the culture, particularly of small fruits, is increasing proportionately; and I doubt not that if this missionary enterprise was carried forward with earnestness that we would not only largely increase our membership, but would add greatly to the permanence and prosperity of the horticultural interests of the State.

CONSTITUTION AND BY-LAWS.

It appears to me that the time has arrived when we should consider whether this society has not outgrown the constitution and by-laws under which it is working. There seems to be some unnecessary ambiguity in them that I think might be eliminated therefrom.

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WORK AT TRIAL STATIONS.

Though our State is not divided by ranges of hills or mountains, it yet has a wide range of climate. In a correspondence last summer with George Shaw, of Decatur county, (whom many of the older members of the Society remember with pleasure) in reference to the old Mormon pear trees, of their long life and fruitfulness, that have been noticed in our reports, he wrote me that pears for the last thirty years had been his most profitable crop; while in the north counties the Oldenburg is none to hardy. I wish to call attention to pear culture, and to the desirableness of a more active effort by this society to distribute to our Trial Stations seeds, scions and cuttings of the most promising kinds of fruit to be found within our own borders and in adjoining States.

And just at this point it may not be inappropriate to say that my purpose in writing Mr. Shaw, was to buy a bushel or two of the best of those pears, and distribute the seeds of them at this meeting among the members, particularly of the trial stations. But I was greatly disappointed in not being able to do so. Mr. Shaw referred me to Capt. J. D. Brown, one of the directors of the State Agricultural Society, who is the present owner of the land on which most of these trees stand. I had the pleasure of meeting Capt. Brown at the time of the State fair, when he told me that he had the misfortune to lose a large part of the trees during an absence from home—I believe, by having the bark stripped from the trees by a drove of large hogs that were permitted to run among them.

Though there are some of these trees still living, Mr. Brown expressed great regret for the severe loss that he had sustained, and the horticulture of our State is doubtless suffering severe loss also from the loss of promising seedling fruits that should have been widely experimented with. There is, I believe, abundant evidence to warrant the statement that a liberal planting of pear seed from the hardiest known trees and varieties, particularly in the south half of the State, would repay many fold the expense incurred, and tend greatly to arouse an interest in the cultivation of this delicious fruit.

DISTRICT SOCIETIES.

The justice and wisdom of the act of this society at its September session, in extending financial aid to the district societies, will now, I think, be acknowledged by all. It was a measure of relief that these societies sorely needed, and I now most earnestly recommend that this society make an annual appropriation of not less than fifty dollars to each of the three district societies for the purpose of aiding them to offer premiums on fruits, trees, flowers and garden products, or in such other way as they deem best for the promotion of the horticulture of their several districts.

These district societies are to be the missionaries, in a large sense, that are to build up horticulture in the border portions of the State. If their influence is strong and active, it will call into being local auxiliary societies that will constantly add numbers and strength and greatness to this society,

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and wealth and happiness to our citizens, and the State; and the measure of usefulness of this society will be largely in proportion to the number and activity of these subordinate associations.

ARBORETUM.

Whenever it is the pleasure of the society to consider the subject of an arboretum that received a good deal of attention at our September session, the committee appointed to examine and report upon the Arnold arboretum, are, I am informed, ready to favor the society with such report.

AGRICULTURAL AND INDUSTRIAL INSTITUTES.

The subject of Industrial Institutes should receive by this society the full measure of attention that its merits demand. Through these institutes there is undoubtedly a new field opening for useful horticultural labor, and I would recommend that such action be taken as will give this society a creditable representation in the work of these institutes.

We are printing the transactions of district and local societies without any special provision for such work. We have extended financial aid to the district societies and our Constitution should give us authority for so doing. In the hands of a judicious committee, there can I think be no question that the Constitution and By-laws of this society can be so framed as to be more in harmony with the enlarged sphere into which this society has grown.

Permit me to suggest that one of the By-laws of this society should require the annual publication of our Constitution and By-laws, also the laws relating to horticulture, and perhaps the organic act creating this organization.

The secretary read resolutions of western Iowa and Delaware county horticultural societies, urging that the annual report be published earlier.

C. W. Burton, secretary of the eastern society, said his society had passed strong resolutions on the same subject, and that there was a general desire to have reports in time for spring planting.

Past secretary Brackett said that there was no delay on his part in getting out the report, and that the report was out as early as common, and probably earlier than it would be possible to get it out this year, as the Legislature being in session now would cause a greater amount of printing than went to State printing office in years when the Legislature was not in session.

C. L. Watrous: One thing would help; we have a little money now, and I think it would pay to have our secretary come here and stay here until the work is done. In this way a good deal of time can be saved.

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G. B. Brackett: I do not know of a single society in the United States that gets its report out in time for spring planting, and some of them meet very much earlier than we do.

Motion of C. L. Watrous prevailed, that the secretary limit report to as near five hundred pages as possible without detriment to report.

Motion of C. L. Watrous prevailed, that a committee of three be appointed to condense and revise papers for publication.

Committee appointed by president as follows: Geo. Van Houten, C. W. Burton and R. P. Speer.

Committee on president's address, C. L. Watrous, John Wragg, H. W. Lathrop.

J. M. Elder, director of twelfth district, reported as follows:

REPORT FROM THE TWELFTH DISTRICT.

BY J. M. ELDER.

The Twelfth Horticultural District comprises nine counties in the northwestern portion of the State, with an area of about 5,000 square miles, and lying on the Minnesota line for a distance of over 150 miles.

To visit, or even by correspondence become acquainted with individual experiments of the workers in this extensive horticultural field, is simply impossible.

I am indebted to several individuals for excellent letters on this subject, which with my own observations in several counties, am enabled to form a fair opinion of our present standing.

The loss of fruit trees from the effects of the past winter was small. Indeed, during my long residence in this portion of the State have never known one less disastrous to tree, vine or small fruit.

Excepting possibly in the extreme northwest portion of the district, apples were a failure, and to considerable extent plums, currants and gooseberries. Strawberries and raspberries did much better.

I have rarely noticed in early spring a finer appearance for an abundant fruit crop than that of 1887, but owing to causes about which some diversity of opinion exists, the bloom was dull and lifeless and the young fruit fell off as soon as formed. I am inclined to believe the unusual dry season of 1886, was the principal cause since we had neither excessive spring rains or late frosts.

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Since the destructive winter of 1884 and '85, we have been reduced to elementary principles so far as the apple is concerned, but unlike the seeker in the Billy Patterson mystery know who struck us. The fine young bearing orchards of a dozen varieties so frequently seen, previous to that disastrous winter have disappeared, and I regret to say with them much experimental energy that is now more needed than a quarter century since. Many valuables, however, have been saved from the wreck well worth the saving and perpetuation.

The Duchess has proven equal to all tests, and of less value but equal hardiness, we have the Tetofsky, Whitney's No. 20, Brier Sweet and other valuable crabs, while the Wealthy comes in such a fine second, that by further trial may become fully reliable.

The Haas, Plumb's Cider, Utter, Tallman and some others though failures have exhibited a vitality that encourages a belief that new varieties will be discovered to meet all our reasonable wants.

I have universally advised the planting at commencement of only the hardiest sorts and later as leisure or inclination dictates experiment with what appears next best, and under all circumstances avoid the thousand novelties so artfully presented by unscrupulous tricksters.

I find that success or even partial success though in a small way is the surest road to such experiments as will in the end prove beneficial, while on the other hand a signal failure even when nothing else could be expected, like a blight infects everything in its vicinity. The Home Croaker is nearly as bad as the foreign tree agent.

Grapes are successfully grown with proper care. Our rigorous winters so disastrous to the apple, have but little terror to the grape grower. The Concord, Janesville, Worden and James Vick, are most common, but many of the less hardy and perhaps finer varieties are grown as successfully. One of my neighbors who has been particularly successful with these latter kinds, says, that to insure safety all varieties should be taken down during winter, and when this is done, one variety can as successfully be preserved as another. His mode after taking down the vines is to merely cover the tips with earth.

The wild plum under almost every name but its own is generally cultivated. I can hardly think of any deception that works less injury for while most purchasers are paying for what could readily be had for nothing, are without doubt growing the best fruit of the kind known to this district. I know of no cherry worth cultivating if the stock were presented to start with.

Small fruits do well everywhere, but as much diversity of opinion exists as to relative merits of many kinds I will omit a very general report, but will say that the very best bed of strawberries I ever saw was half and half Crescent Seedlings and Captain Jacks. I doubt if with the common kinds, or with the ordinary grower, a better combination can be found.

The Downing and Houghton I believe to be our best Gooseberry. The latter variety mildewed badly at one time with me, but since I have sprinkled the bushes with sulphur, have had excellent returns.

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Smith Seedling has failed with me.

In conclusion, I will recommend the division of this district. Its proportions are unwieldy, and in every county are intelligent, wide-awake horticulturists who will gladly take charge of a part, and thus increase the usefulness of our Society and generally advance the cause.

DISCUSSION.

J. M. Elder: I desire to say something about an apple growing in our vicinity. About ten years ago a man named Chapin sold trees in our neighborhood. There were ten trees labeled Winter Crab, that the parties ordering did not take. The trees were offered for sale at a nominal price, and I bought them. I distributed them out to several parties, and when they began to bear we thought they were Wealthy. They have been bearing for several years and have borne well. Last year they did not bear as well as common, and the birds injured many of them. They are growing in five different places and have done well.

Adjourned to 7:30.

EVENING SESSION—FIRST DAY.

C. L. Watrous read a paper on Origin of Varieties as follows:

ORIGIN OF VARIETIES.

BY C. L. WATROUS.

Last September it was my privilege to spend some days in the vast hall at Boston, wherein was spread out the magnificent exhibit of the American Pomological Society. There were the finest fruits of the temperate zone, with trees and fruits and flowers in lavish profusion.

A single plant out of this abundance—and not by any means the most conspicuous—had been sold for $2,000 by one florist to another- One display of grapes contained 163 distinct varieties; yet it is not because of the beauty nor of the profusion of the exhibit that it is mentioned here.

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One single table out of this vast multitude shall engage our attention; a table containing the exhibit from the Arnold Arboretum, hard by.

That exhibit showed the most primitive forms known, of many of our most valuable fruits. There was, among others, a vase filled with branches of the primitive form of our apple, loaded with the lineal descendants of the veritable apple that Eve ate; at least, that is what the grave-faced director of the arboretum assured the many ladies who curiously gathered near, some of them looking as if they believed one of the little apples might suddenly turn into a serpent and do them an injury. The fruit did not seem capable of much harm, being in size no larger than very small cherries, and of a quality concerning which the least said the better. Yet about these little crab apples hangs mythology and tradition and history and poetry and religion, enough to fill libraries. Leaving the other fruits on the table, let us ask these crab apples some questions. Where saw they first the light? And how is it that we have from such humble beginnings our delicious Early Joe, Benoni, Dyer, Porter and Rambo for summer and autumn; and, for health and pleasure through all the winter, the noblest fruits under the sun, the Jonathan, Grimes' Golden and Spitzenburg, the Baldwin and Pippins and Northern Spy, lasting in favored climes until apples come again.

De Candolli, in his "Origin of Cultivated Plants," tells us that the apple seems to be most indigenous in the region lying just south of the Black and Caspian Seas, and to have extended from there into Europe, where it grows wild in all parts except the extreme north. Near this cradle of the primitive apple appears also to have been the birthplace of the quince, the cherry, the plum, the pear, and the grape, as well as the birthplace of the great Aryan race of men, the ancestors of the ruling nations of earth to-day, ourselves among the number.

How did it happen that the finest fruits of the earth, and the ancestors of the ruling nations of men, were first cradled in the same region, near the eastern limit of the Mediterranean and south of the Black and Caspian Seas? Did it, indeed, happen at all? Or, is it true that the finest races of men have the most delicious and valuable of fruits because, and only because, they have devoted the most labor and the most skill to the development of rich and well tasted fruits from humble beginnings? I must incline to the latter view of the case, since the really great improvement in the abundance and quality of fruits has mainly taken place within historic times, and we might say, within a few years.

Many of us have read the criticism of the Scotch gardener, when taken to examine a famous picture of Satan tempting Eve in the garden of Eden. After careful scrutiny he said: "I have no great opinion of the picture; Satan is represented as offering Eve a variety of pippin not known above fifty years ago. True it is, that most of our favorite varieties are of very recent origin and due entirely to the fostering care of civilized man.

Mr. Darwin points out the fact that we do not owe a single useful plant to Australia or the Cape of Good Hope, to New Zealand or to America, except

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within the tropics or near them; nor any edible or valuable plants, except the Canary grass, to any Oceanic or uninhabited island.

After careful examination of the facts he concludes that the poor quality of fruits and grains in savage lands is not due to any lack of natural forms suitable for amelioration, by cultivation and seedling selection, but to the absence of civilized energy in those lands to direct the process. According to De Candolli, we owe thirty-three useful plants to Chili, Peru, and Mexico, but this selection and improvement of wild plants was not more surprising than many other monuments of civilized labors left by their ancient inhabitants.

Says Darwin again: "In North America the natives cultivated maize, pumpkins, gourds, peas and beans, and some European sorts may be descended from these. Had North America been civilized as long and as thickly peopled as Asia and Europe, it is possible that the native grapes, walnuts, mulberries, crabs and plums, would have given rise to a multitude of varieties, extremely different from their parent stock."

Out of a list of one hundred and fifty-seven of our most useful fruits and plants, De Candolli admits that as to forty of them their parent forms are doubtful; and Darwin says that the difficulty in explaining this fact is only to be settled by supposing that such plants have been profoundly changed by long cultivation, so changed in fact that their own ancestors would not know them. In the course of a long and very interesting discussion of the origin of varieties, Mr. Darwin quotes many authorities to show how savages are often compelled by hunger to test the edible qualities of all plants, roots and leaves offering the least promise of usefulness. Savages are said to be guided by the experience of wild animals in selecting wild plants for trial as food, especially by the habits of monkeys and baboons in tropical lands. Nothing sharpens the senses like necessity, and we can readily imagine how various ways of rendering plants eatible were tried, and the experience handed down in tradition for future use

From a knowledge that a grass or fruit possessed some value in appeasing the pangs of hunger, the step to cultivation is not long. Seeds would be dropped in the partially enriched soil about a native settlement, or plants transplanted from the forest. The improved size and quality of fruits would suggest further efforts, and then the door is wide open to all the excellencies.

Says our own Downing: "Transplanted into a warmer aspect, stimulated by a richer soil, reared from selected seeds; carefully pruned, sheltered and watched, by slow degrees the sour and bitter crab expands into a golden pippin, the wild pear looses its thorns and becomes a burgamott, or the almond is deprived of its bitterness, and the dry and flavorless peach is at length a tempting and delicious fruit."

This has been the origin of all our varieties. Changed conditions have broken up the habit of close reproduction from seeds. Favorable variations have been raised and propagated; and this is the only royal road to the production of new and desirable varieties. If, as Bacon said, "Fruit is the flower of commodities," then is gardening the flower of all human labors. Many authorities might here be quoted to show that the greatest excellence

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of a variety, as a rule, is displayed within a limited area near its place of origin, but space forbids.

At the exhibition of the American Pomological Society, heretofore mentioned, the grey-haired chairman of the fruit committee emphasized this fact in the strongest manner—as having been shown at the great fruit exhibitions which he attended during a long series of years. Said he, "the premium fruits have as a rule come, from year to year, from places near their places of origin." Others present assented, and the reason is not far to seek.

Varieties originating in any locality are selected for propagation because of excellences as grown under all the conditions of soil and climate prevailing in that locality.

Other places must differ in some degree and the rule is that these differences, whatever they may be, are not so well suited to the plant as the precise conditions under which it achieved its fame. A lack of knowledge, or a disregard of this fundamental truth proved by ages of experience, has lately given us in Iowa many bitter disappointments, and has planted the trees for a much more abundant crop of this dead sea fruit in the near future.

Do varieties run out? There seems to be no good reason to doubt that varieties appear, run their appointed course and fail, under the operations of the general law of development which governs all created things.

One of the greatest of American authors compares the course of animated nature to a great river. There is always a flood, but the atoms of water that compose the flood are approaching, are passing and are disappearing beyond the sight of the observer forever.

Mr. Thomas Meehan said, in a recent number of the Gardner's Monthly, "It seems to be a law of nature that all things, sooner or later, shall wear out. Thousands of species of plants have been on the earth, as fossil botany shows, that have been worn out and replaced. There is no reason to believe that varieties have any more power than species."

He might have said, nor can varieties be supposed to have as great power as species, since no part can be as great as the whole. A recent article in England says that out of 500 roses in the catalogue of Mr. Rivers in 1834, not one is now found at rose shows. A later writer states that in a certain locality famous for growing potatoes for market, not a single variety remains that has been in cultivation twenty-five years. In a recent letter Mr. Meehan says: "My proposition is that variation is a necessary condition in the general order of things, and exists for the good of the whole; that variation is in accord with a preordained plan; and that the only agency of man in the matter is the bringing together the conditions necessary to germinate the seeds already there."

If this constant variation and disappearance of old forms is true of plants propagated in the natural way by seed, much more is it true of varieties propagated by buds, as are all our varieties of fruits in nurseries. Varieties thus propagated have no power of adapting themselves to changes of cir-

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cumstances by slight changes in structure, as constantly happens in seedling reproduction.

Prof. Gray says there is good reason for expecting varieties propagated by buds to become weaker than a variety propagated by seeds, and adds: "When Mr. Darwin announced the principle that cross-fertilization between two individuals is the plan of nature and is so universal as to sustain the the inference that no species self-fertilized could continue to exist, he made it clear that a series of plants propagated by buds only must have a weaker hold of life than a series reprodnced by seed. He states in the plainest terms that the union of the life of two plants in seedling reproduction in some unexplained manner, does re-enforce vitality. How this is we can not say, but the fact is undeniable. It is and has been nature's way since the beginning of time, and any departure from nature's methods lowers vitality. It is the law of all animate things.

When varieties of fruits long propagated by the unnatural methods of grafting and budding are removed far from the places of their origin, where soil and climate are alike changed, and especially where the conditions of plant life are trying to the strongest organisms, is it ground for surprise that many failures occur? Nay, should not every thinking man expect disappointments and losses? Nature does not change her laws to suit enthusiastic hopes.

Without malice and without remorse her laws find means of securing their own execution.

That the climate of a prairie region is less favorable to plant life than a maritime one, is shown by the failure here of most fruits in repute in our Eastern States. Comparing American climate with that of Europe, Professor Rogers, quoted in a recent American work on "The Influence of Climate in North and South America," says: "This continent being more restricted in its dimensions, especially in its east and west diameter than Europe and Asia, yet comprises almost as wide a range of heat and cold, of dryness and humidity.

Here, these extremes are brought together within narrower limits; there, they are expanded both in latitude and longitude over wider zones.

Here, geographically, their transitions are more abrupt; there their gradations are more gentle. This close packing together of the various belts of temperature and humidity, the result of closer proximity of the earth's tropical and polar currents, oceanic and atmospheric, occasions the several climates of this continent to act and react upon each other with greater potency. Hence, the whole region is one of marked climatic contrast, as striking when we compare different districts, as when we regard the different seasons!"

These words were written twenty-one years ago, long before any claim that the climate of certain parts of Europe is the duplicate of that in parts of the Mississippi valley, and the adaptability of their fruits to our wants, asserted as a logical conclusion therefrom.

It is an unbiased and scientific conclusion, from observations taken in great part by the United States army surgeons at the various military posts

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of this country, compared with like work in Europe. A volume could be written to corroborate the conclusions here reached, as to the extremely variable character of American climate compared with European. The climate of this great valley of ours is equally variable and extreme when compared with either of our great seaboard regions.

Granting all these premises, where do we stand, what is the outlook, and whither must we shape our course to reach the haven of safety?

Every nurseryman here knows that we have been and now are mainly propagating fruits and plants originated, and at their best, in regions near our eastern sea coast, some in fact being natives of a different grand division of the earth's surface.

In an extremely severe and trying climate, we are trying to succeed by propagating by unnatural ways fruits and plants already weakened by a long course of such treatment, and in the first place bred in distant lands, under profoundly different conditions of soil and climate, and a host of them under alien skies. Is there not reason for surprise that the failures are so few and the successes so many?

I think a careful consideration of facts, like those herein noticed, will bring our judgments to an affirmative answer. I see no reason to expect full success, as we are now sailing.

The proposition that this rich region is naturally unfruitful is disproved by the most careless examination of our groves and thickets and fields. The wild forms of the apple, the plum, the cherry, the grape, the currant, the gooseberry, the strawberry, the mulberry and the juneberry, show, as I I am ready to maintain, a greater promise and potency of abundant and delicious fruits from these soils and under these suns, than any other region of the earth's surface.

Botanists affirm that America far exceeds Europe in the richness and abundance of vegetable forms; the abundance and variety of our nut-bearing trees is a corroborative fact. Our hickories, hazels, the two walnuts and the pecan point out favorable conditions.

The haven of our rest will be found in new races bred and selected under all the conditions that have produced naturally such promising forms of fruits and nuts. Our chart and compass are open to our view in all the triumphant experience of other men in other lands.

With all their experience to guide us, with all the discoveries of modern science in cross-fertilization, with wealth and knowledge and leisure, in a favored land where the efforts of civilization run little risk of being quenched in bloody wars, why should we not go forward with stout hearts?

Most of us here have done our heavy labor in this life. None of us can hope to behold the end of this journey, but we may commence the work. No one so old but he can sow seeds. If he does not select the fruit another may; and the common work will flow forward like the full flood of a mighty river.

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DISCUSSION.

H. W. Lathrop: An idea brought out by the paper, that plants and varieties deteriorate, I think the experience of every one will approve. The potato can be instanced as an example. Twenty-five years ago we had the Orange, and then the Pink Eye; and later, the Early Ohio and other varieties of a similar character. The older varieties have become worthless—run out, we might say. They have been propagated in the same manner that we propagate trees from scions; the potato from cuttings, so the scions are but cuttings of the trees. Now the fruit of the potato grows at the top, the seed being in the balls; now the potato protects itself from deterioration in these seeds from the balls, and we find that we must plant seed and get new varieties, in order to preserve the vitality of our potatoes. With potatoes we can get new varieties each year, but with the apple it is slower work. If I put out a graft or bud, I must wait five to ten years before I can reach a conclusion; with potatoes we can reach *certain* conclusions in a short time, but with the apple it takes much longer. It will take one hundred years to reach conclusions with apples similar to what we can reach with potatoes in ten years. We are commencing this work now in seedling productions with the apple, and must continue it, although it will take many years to see the benefits of our labor.

Prof. Barrow read the following paper: "Relation of Horticulture to Education."

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HORTICULTURE AND EDUCATION.

BY A. C. BARROW, AMES.

What I have to say will be in form an answer to this question: What are some of the educational benefits of practical horticulture? You will please notice the word "some," which shows that I do not intend to review the whole subject. Indeed, I have had time, since I undertook to give myself the pleasure of meeting you only to select among the different conclusions at which I have long ago arrived, those which I would now present. And please notice particularly the word "practical." I heartily believe in "book horticulture," when the book is made a suggestion, a guide to a man or woman who actually works with his own hands in the garden. But when all the garden is contained within the covers of the book, I care but little for it. When the ideas and experiences are another man's they will benefit you, provided the plants and the soils, and the work is yours. Of course there is a certain amount of education to be acquired in studying about horticulture, but I care more for the education that may be secured in the actual pursuit of horticulture, whether as a business or as a recreation. And for this reason I am convinced that students of horticulture should not merely be placed where they can see the plants, the operation, the progress of the season, the results of successful management, and of exquisite taste, but should be required themselves to do each and every act of the business horticulturist, if they would best discipline themselves by the study.

This, then is our question: What are some of the educational benefits of practical horticulture? That must depend somewhat upon the style of the horticulture; it will depend upon the surroundings of the garden where the education is going on. It will depend upon the student himself. There are gardens which seem principally to teach that Dame Nature abhors a vacuum, and has seeded in advance every foot of soil, and will crop in her own way all unmastered places; or that she has such an appreciation of garden crops that she has provided lafers from Colorado to tend egg-plants and white hovering wanderers from Europe to look after cabbages when we neglect them; or that every weed has the ambition of an Alexander, and has set out to stock and hold the whole world; or that pigs, horses, chickens, cows, understand more about fences than some calves who profess to make them; or that short rows and many turnings are more extravagant than the highest price seeds and finest tools; or that parsimony in buying seed and stock will make heaps of vegetables and fruits selling at the close of the markets, like old maids, with no takers. But there are gardens and there are

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gardeners, and open-eyed, receptive people, such that when they can be gotten together there will be school, master and pupils, all fitted for the best educational results.

I. What I have just said about the inferences which a wise head will make as he looks over a half-worked garden suggests the most important matter. The great doctrine of science is also the foundation of successful life, and one noblest support of a good character. In science we call it casuality, the relation of cause to effect, in character it is hearty obedience to the demands, the nature of things, without self-will or repining, in successful practical life it is the steady working out of good ends, by energy upon the right means. Of course this may be studied always, every where, in any thing; but horticulture offers unusually favorable opportunities to study it, for it offers us a great many clear and striking connections of cause with effect, big game standing up still at which the untaught marksman may learn to shoot his reasonings, and it has plenty of obscure relationship, to make yet finer the sight and skill of him who has learned to bag things that show only a feather among the brush, or go whirring off at the first approach. And it offers plenty of schooling in the contempt of superstition, though it must be confessed that *that* class is apt to be somewhat backward. There are events so striking that we are led to endow them in belief with a great deal more potency than nature has given them in fact. Thus, most every body is more or less terrified by loud thunder. The over powered ear over-powers the other senses and faculties. Although we know that thunder has never done any thing worse than to shatter glass—and those nerves which nerves have been wrongly trained to be startled by it—yet we have been so long accustomed to fear it, we have in our nerves such an inherited and cultivated responsiveness to its sudden onset, that we can hardly overmaster fear, (not to say avoid the rise of fear at all) even when we know well that our hearing the thunder is absolute proof that the danger is past. Thus the mere strikingness of phenomena leads us to make them causes of effect at random. Such is the origin of many superstitions. Horticulture is not yet by any means free of them. But surely it offers the mind chances good enough, and frequent enough to satisfy the most exacting to test them, and prove their lunacy. The business of horticulture is almost wholly an adaptation to demands of nature utterly beyond the control of our wills, *i. e.*, to natural laws. This holds also of any business to some extent. But in many occupations human will may come in to disturb all relations. I have known an excellent sermon to lose its effect because a mouse was running around the pulpit under the preacher's nose. But if you will work your raspberries and grapes just right, Barnum with all his elephants, kangaroos and fools could parade in front of them and they would go right on growing and ripening their crops. I have known the very best citizens in the town to be thwarted, their wise plans to be balked, and their well-directed toils wasted, because of the mean jealousy of loafers and rivals who talked and talked and spit out suspicions. But all the loafers in town, all your enemies, all the opiniated stupids who think that what they don't know isn't worth knowing may lean on your fences till

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they line them like sparrows; never mind, your plants can't be prejudiced against you by their chatter. If you will do your work right, the effect will come true sure and abundant. It is just a question of fitness of means to ends, and teaches the detection of causes and the choice and use of means with wonderful success, for the causes and limitations are many and very imperative.

Climate dictates one set of laws. We must know the effect of climate upon each variety. We must artificially lengthen the season in the spring, and overcome or hide from the rigors of winter. If after a full experience we find that the climate is too cold, or hot, or changable, or wet, or dry, or blazing, or cloudy for our present stock, we must ransack the world from Siberia to Patagonia to find something better fitted to it, or we must undertake, by a lone process of careful selection to derive from something which will now live, a straw that will also yield the products we desire.

Soils hide in their hearts another set of commands. They keep still about it, but they are very self-willed; we must learn to hear, understand and obey them. The elements of fertility, the elements that determine their mechanical texture, the different ways in which different soils are to be manipulated, the subsoil, the drainage, the aspect and the history of the treatment and cropping of each lot, and many other such things are to be known and kept in mind, and must regulate our conduct, and all this involves a discipline of the judgment of the utmost value. Men who have lived on a sandy soil, which they had been accustomed to plow when full of water in the spring have moved upon clay lands which they ruined by having more energy than discretion in early spring—the genuine April fools of clay farms. This was because they had never thought and understood why they could with impunity work very light sands when wet.

Every genus and variety of plants must be studied; its habit of growth, the number of days it requires, its preference for sand or clay, for sun or shade, and many such details are to be known. There is a safe and easy way for everything—though the safe and easy way of managing some things may be yet to be discovered. For example, it has been lately learned that Hubbard squash need not be sown till the latter part of June—in northern Ohio the first week of July. This I say is a recent discovery, and probably not one in ten of those who grow Hubbards know it yet. Now what is such an item of knowledge worth? It saves, first, all the work otherwise put on the crop before that date; secondly, it avoids all the trouble caused by the striped beetle; third, it makes it possible to treat Hubbards as a second crop, after early peas and even cabbage. A few years ago, when I was living in Portage county, Ohio, where the first killing frosts may be expected September 20, I sowed Hubbards in open ground June 25th, and on the 4th day of July I dropped seed in my Wakefield cabbage plat, in the spots from which the earliest heads had been removed. My neighbors, without exception, predicted failure—plenty of leaves but no hard shells. One of these neighbors started his vines under a glass in large inverted sods, in April. He transplanted, protected with netting, and when they had outgrown cover "bugged" them carefully day after day for a whole month that my seeds were in

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a packet in a drawer in the house. But in October I had from each of my patches a better crop than he, with certainly less than one-fifth of the labor, But I guess it wouldn't pay to try any such a time and labor saving system in all things—onions, for example. This is given as an example of the posibilities of species, and the study of the peculiar properties of growth and development in different varieties is more and more important every season, and happy is the horticulturist who knows that he does not know all about everything, who is always learning—that is to say, who makes his horticultural life a life-long education by hearing, trying, testing, judging and at last knowing. The markets also have a set of imperative laws of their own. What do people want? How do they want it offered so as to catch their eye and make them buy? Where do customers live? How many of them live in each place? How to pack and ship? No man needs a more exact and full acquaintance with the arts of packing and shipping than the horticulturist.

Horticulture is one of the most progressive of all pursuits; and the progress is exactly of the nature assumed by the theory of the survival of the fittest. Darwin holds to the stocking of the world by natural selection. We know that the best gardens are stocked by intelligent selections. That the process by which the sour is sweetened, the rough is smoothed, the small enlarged, the late made early, is identically. That controling and keeping and transmitting of some variation, which, according to Darwin has made the present flora of the world—only he speaks of natural, we use purposeful selection. Now all readers of Darwin's books can see that he never could learned his theory from or proved it by facts of uncultivated nature. He found it in his observation of domesticated plants and animals. And the practical horticulturist who keeps himself abreast of his profession, who also means to make some contribution to the advance of his own chosen business must be constantly at work upon that very same list of facts, must be steadily applying the very same principles that make up the most important and wide sweeping doctrine of the country.

The science of life, that is to say, the science of the birth, growth, maturing, death, decay and propagation of living things, is called biology. It is to-day the queen of the sciences; to it they all contribute. It is the highest, the most complicated, the widest reaching, the most difficult and most closely related to human welfare. Agriculture and horticulture are practical applications of the science of biology to the production of valuable life. Horticulture is narrower than agriculture; it ignores all that relates to the production of animal life, confining its attention to the animal world only to protect its plants against enemies, *i. e.*, our enemies, the too devoted lovers of our plants. It also devotes itself to the production of only a part of the useful plants, but adds the long list of the ornamental. Within these limits is never anything else than a using of the science of biology for the purpose of producing certain desirable forms of living things. And whatever education a student of biology can find in his studies, that a horticultural worker can derive from his employment, if only he is willing to put his mind, as well as his body, into his business. What is the training of our

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reasoning faculties, but a discipline in forming just such conclusions as horticulture demands? What is meant by powers of close observation, careful comparison, accurate classification, just reasoning, sound judgment, wise adaptation of means to ends, and forecasting of results and dangers, if it be not the power to do just such things as horticulture demands every day? There are merchants, bankers, lawyers and other men who thank their gods that they are engaged in intellectual life, not in plodding physical toil like gardeners; and yet they do not have any such number and variety of problems to solve as the gardener. There are geese successfully driving goosequills behind wire screens, who couldn't have raised the goose in the country.

As compared with farming, gardener's products are more perishable and and higher priced. For example, I once sold in mid-summer 270 dozen ears of sweet corn from a little patch, at a cent an ear. I was ahead of the market, and so got an honest monopoly of fresh, unwilted sweet corn given me without interfering laws: my labor ended with picking the ears. A farmer growing field corn would have had to let the corn stand and ripen, and then husk it; yet he can never get a cent an ear for his crop. But he could store his hard corn. I could not store tender sweet ears. This difference is generally observed; in fruit it is much more marked than in this case, for just because it is so slight, because sweet corn is sold at prices so little above that of field corn, gardeners are generally turning it over to farmers in places where gardening is at all pushed. Hence gardeners generally make their soil much richer than farm lands; they apply very much more labor to each acre, and they cross more heavily, generally aiming to take two, often three crops from the land each year; in other words, gardening differs from farming something as railroading differs from teaming; it is farming pushed; farming under pressure, applied to plants that can be pushed, and which it will pay to drive under pressure. Good gardeners aim to have a head on the shoulders of every cabbage, flowers and buds on every rose, berries on every plant. They will compute the number of feet they have under glass, and aim to make every foot report something; therefore they limit their acres, and give to each acre almost unlimited manure, care and culture. The same may be said of the ornamental department. This system keeps the faculties alert. Constant and close observation is called for. There must be decision and promptness of action. Mechanical appliances must be abundant, varied, adapted to the work, and in order. New stocks and methods must be kept track of. The marking and their shiftings must be followed; neat packing, safe shipping, quick delivery, are doubly important, for a gardener cannot send to crib or elevator waiting for a rise. They need no quotations of options on January strawberries. From this it follows that gardeners are furnishing ideal standards to farmers, and are receiving the education that comes grom ideal work. One thousand bushels of onions to the acre have been grown, shipped and sold for cash in more than one town. Tomatoes have done still better; 400 bushels of potatoes, and over 120 bushels of shelled corn to the acre have been secured. I refer not to computed crops, not actually made, but figured out by the rule of three from the product of

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a few fancy rods or yards In that sort of rule of three the devil is apt to be the biggest one of the three. But I refer to crops actually harvested from several acres of land. And when the growers of these grand crops have described their processes, it has been all summed up in one sentence—"I garden," or "my land is like a garden."

And now remember that horticulture has a vast and varied ornamental department. About the first and greatest success of a good county horticultural society is the multiplication and improvement of lawns, which are the one most indispensable condition of successful outside home decoration. Then come the trees and shrubs that overlook the lawn, and the thousand and one things that make up the difference between homes and burying places. Remember also that an important element in the value of all fruits is beauty. The man who cares not for looks will find that customers care not for his products. Good taste, neatness, even delicacy and little touches of art, are better salesmen than even a soapman's exhaustless lungs.

Now, education is only a name given to the reflex influence upon a man's own mind, body or heart of his activities. An educated mind is simply one that has itself done certain mental work, and has stored up the strength, quickness and notions called out by that work. An educated eye or ear or hand or temper is to be defined in the same way. Granting then, that if a man is a clod-hopper at heart, and content to remain so, he can plod through horticulture and get no more education from it than the mouse got by gnawing every copy of Sophocles dramas, it remains plain that he who will put a full manhood into this business will find it a good master to teach him.

And if this is the true definition of education, the class-students of horticulture should always be kept face to face with living plants. Purely with reference to educational results, and conceeding no market profit to the articles produced, and with no eye to the possible disasters that may follow blunders, a student must handle the living plants himself if he would master that part of the science of biology which concerns himself and would gain the reflex benefits which mark the educated man. The eye is a part of a man and needs training; the hand is a part of a man and should be disciplined to act quickly, surely, delicately; and all our faculties need to be kept in close contact with facts, and held to consequences to keep our heads level, to winnow out our delusions and expel superstitions. Phythagoras and Darwin were both wonderfully smart men. They both studied beans, each in his own way. Pythagoras, by his method discovered in beans the souls of former generations and forbade his disciples to eat beans for fear they might become cannibals of their great-great-great grandparents souls. But Darwin, by his methods was never able to see an old Greek's soul in a bean, but he did learn how a bean climbs a pole. The one was real, the other was sham knowledge. The cause of the difference was that Darwin kept himself closely to facts by following living plants day by day and hour by hour. Whenever we have students of any science who are not kept close to nature, and held to a knowledge of her processes in detail we shall be told a good many things as interesting and as true as the notion of Pythagoras.

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Even with regard to so important a matter as the formation of a good English style, the ability to express oneself clearly and to the purpose, I hold that these principles apply. There is a vagueness in the speech of most students which shows that they are trying to use words beyond the range of their ideas. The greatest writers have been close observers of things. A man who is a close student of the facts of horticulture, and who as he has leisure, will try to write down exactly what he has seen, and done, and felt and enjoyed when among his plants, will not only be acquiring a good English style, but will be laying a treasury of ideas of just the sort desired for embelishment. The beauty of horticultural products at all stages of their growth is such that he who can describe them in daylight words, will not be at a loss for means either to utter his thoughts or to clothe them in beauty. But it is often supposed that a fine writer cannot stoop to such common-place facts. Well, would it be possible for a young man who had in him the stuff of which poets are made to come down to an accurate statement of the points of a horse. This is what he made out of it:

> "Round-hoofed, short-jointed, fetlocks shag and long,
> Broad breast, full eye, small head and nostril wide,
> High crest, short ears, straight legs, and passing strong,
> Thin mane, thick tail, broad buttock, tender hide."

This occurs in the earliest extant poems of the author, and in the same piece he gives us a carefully accurate description of the way in which a hare acts in seeking to elude hounds. Later in life he left his country home in the middle of England, and went down to London, carrying a mind so stocked with country sights that he was never at a loss for an ornament, or for ability to express it. For the man who wrote in this style at the beginning was Shakespeare.

And now to conclude I want to call your attention to the diffusion of refinement by horticulture. A cultivated man becomes of necessity a cultivator. Refinement causes refinement. The educated must be an educator. His quality is in him, and will go out from wherever he is. Horticulture fills our towns and surrounds our homes, and covers our tables with beauty, it refines all, it spreads elegance with its comforts, good taste with its delicacies. Its best symbol is the tree with its disseminator by the million with its bloom and fragrance and buzz in spring, its compact dome of green in summer, its many colored fruits in autumn, its treasured stores in the winter,—the apple. Taste is in the business itself, and therefore as it extends, taste must be extended too. Pioneer life was noble, but it was hard and narrow. All honor to the pioneers—and all the more honor because by their labors and privations, they have saved us from perforce confining our attention so closely to the short list of imperative necessities. The appearance of a general interest in horticulture is a proof that the hard cramping of pioneer life is past, that the time has come when we can enrich our home life with the comforts and elegancies of art. The people who confer upon society this priceless boon, may enjoy in their own persons a double portion of its refining presence, if they only recognize their chance and use it.

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Professor Hinrichs read his paper, Climate of Iowa and Russia compared. Paper not received by the Secretary in time to give in appropriate place.

THE CLIMATE OF SOUTHERN RUSSIA AND IOWA COMPARED.

BY DR. GUSTAVUS HINRICHS, DIRECTOR IOWA WEATHER SERVICE.

To the general public this comparison may seem to be without practical value, but at the present time, every horticulturist in Iowa and the Northwest will immediately recognize the material importance of this subject. For, just now many horticulturists in Iowa and in States and Territories adjacent are privately and with State aid engaged in the introduction of Russian apples to take the place of those fruit trees which, having grown and borne more or less abundantly in our climate for from a quarter to a half a century, have largely been destroyed by our severe winters. During the last half dozen years we have had a succession of winters entirely without precedent in the records now extending over half a century.

PRETENDED RATIONAL HORTICULTURE.

The introduction of the "Russians" into Iowa is supposed to be a step in rational horticulture, on the ground that these "Russians" come from a climate which is claimed to be practically the same as to that to which they are introduced. This claim is very generally made by those who are taking a leading part in this transplantation from Russia to Iowa. It may hardly be necessary to present instances before this society; for this topic has been quite prominent in our meetings for some years past. Still one or two special quotations may be advisable for those who have not been present at these meetings. Mr. R. P. Speer, for many years a director of this society, twice its president, and now next to Prof. Budd, the most active worker in favor of Russian apples, says: "Near Moscow the conditions (of climate) are similar to ours, and from there we have obtained many varieties invaluable in northern Iowa. Prof. Budd and Mr. Charles Gibb made a large importation from there." (Report for 1886, p. 355.) On the next page he adds: "Trees from inland Russia *are* adapted to our climate; with them we *will* succeed." The same high, practical authority says (Report 1885, p. 543): "The winter varieties which I have full confidence in, were imported from central Russia three years ago, by Prof. Budd, but they have not fruited in

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Iowa yet. If they were good, hardy winter apples in *central Russia where the climate and soil are similar to ours*, why should they not be the same here?"

It is impossible to be more explicit in stating that the introduction of these Russians is undertaken because of the supposed similarity of climate, and not because they *have* proved themselves "by their fruits," grown and ripened in Iowa *for years*, to be really successful in Iowa.

The same idea pervades nearly all that Prof. Budd has written or said on this great topic. Already in his first most important publication on this subject, he concludes a very brief note on the climate of the "wonderful plain" by the following very positive and very broad statement: "From these notes the idea may easily be gathered that we can find provinces in central Russia where the summer and winter conditions approach ours very closely." (Bulletin of the Agricultural College, 1883, p. 7.)

The strictly pomological discussions on this great practical question were particularly interesting at the last meeting of this society at Charles City. (Report, 1886, pp. 125-130.) It has been taken up by members of this society in public journals since that meeting. Members of equal experience in practical horticulture are found on opposite sides of this question.

I need not say that I am not qualified to take any part in this phase of the great question, beyond stating that my sympathies are on the side of the Russians. Some years ago, I had ten acres of bearing Iowa orchard, and had apples in abundance; but the severe winters have destroyed these orchards, so that they have been converted into corn-fields, and I have myself planted Russians in a small way some four years ago. I say this simply to prove that I have no possible reason to oppose the Russians.

But while my able horticultural friends are discussing this question, and draw opposite conclusions from the facts in their possession, I have been led to more carefully look into the climatic conditions of that part of Russia from which the fruit has been introduced for the reason that it *must* do well here because the "climate of Iowa is *said* to be nearly the same as in the Russian home" of this fruit. Now, while I cannot take part in the horticultural question proper, the climatological conditions of Iowa and Central Southern Russia are well enough known to me from observation and long continued, perfectly authentic records, that I may be permitted to form and express an opinion on the supposed climatic resemblance upon which this enterprise in rational horticulture is based.

GREAT ECONOMIC IMPORTANCE.

Before I proceed to present the facts in the case, it may be well to state that this phase of the question is of not a little practical importance. For if the supposed close similarity of climate be not a fact, then the final decision on the value of Russian fruit to Iowa cannot possibly be obtained in less than a quarter of a century from now. We all know how long certain apple trees have appeared to be just the thing for Iowa; and yet, in the end, they have proved total failures! If the identity of climate on which the friends of the Russians base their enterprise, be not a fact, they will have to

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defer their final opinion until the Russians have been pretty extensively grown in Iowa long enough to have experienced all sorts of Iowa seasons—the *hot* as well as the cold, and the *wet* as well as the dry!

If the supposed close similarity of climate be not true in fact, *the test of the Russians in Iowa can only be completed empirically*, and it would be unpardonable to devote all means and time to their cultivation. In this case, Iowa might in a dozen years from now be as badly off for fruit as it is to-day.

If the rational basis on which the Russians are introduced into Iowa be not well founded, it will be the duty of the horticulturists of Iowa to give only a portion of their time and means to the Russians, and devote not a little work to the development of new varieties on our own soil, and to retain and propagate the best that may so arise.

If the climate of Iowa, as a matter of fact, cannot be found anywhere in Russia, it follows that Iowa horticulturists must continue to persevere in developing such new fruits as will prove themselves worthy of cultivation, and exactly adapted to Iowa climate. In that case, the imported Russian sorts will mainly be valuable in furnishing additional strains of good blood for crossings and seedlings.

NO IOWA CLIMATE IN RUSSIA.

In closing this introduction, it may be as well to state the final result of the climatological study now following, namely, that there is not anywhere in the great plains of central and southern Russia in Europe a province or district possessing a climate that is closely similar to the climate of Iowa in its essential and dominant features. And it may be further stated as a matter of fact, that the regions in Russia from which importations of apple trees have been made into Iowa are from four to eight hundred miles distant from the locality that corresponds most nearly in temperature to Iowa; and neither this locality, nor any part visited by our importers, resembles Iowa in regard to rainfall.

It is indeed strange that practical men speak of Iowa as arid (Prof. BUDD Bulletin, Agricultural College, 1883, p. 7), and compare it to parts of Russia, where the normal rainfall is less than what Iowa receives in a year of extreme drouth.

The importations into Iowa made so far will probably benefit Dakota and Minnesota much more than Iowa, because the climate of Bismarck resembles that of Kazan, and the climate of Ssaratow resembles that of St. Paul, so far as these climates can be compared at all. And the western parts of Russia from which importations have been made, may benefit Michigan more than Iowa; for from Kiew to Riga the climate resembles that of Michigan rather than that of Iowa in its thermic conditions.

CLIMATE ON THE FORTIETH PARALLEL.

To be able to intelligently compare the climate of Iowa with that of distant regions of the globe, we will do well in taking, mentally, a trip around the globe on a parallel of latitude. This will conclusively demonstrate that

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latitude is not as prominent a factor in determining climate as most persons believe. For the sake of greater convenience we shall take the parallel of forty degrees latitude, both north and south—that being the full ten degrees nearest to Iowa drawn on all globes and maps of the world. In this preliminary comparison it will be sufficient to consider the temperature only.

I shall furthermore give all data in tabular form at the close of this paper, and use here only such graphical representations thereof as I have found to be most readily understood. Thus to show how the climate, as to temperature, varies on the fortieth parallel, I have constructed what properly is a *temperature section* of this parallel, on which the length of the vertical lines mark the corresponding height of the mercury in the thermometer for the period specified, while this line itself is drawn at a point determined by the longitude of the place of observation. Joining the corresponding points for the different places, we obtain a *curve* that correctly and conspicuously represents the comparative condition of temperature on this parallel of latitude for the time specified.

For this general comparison it is fully sufficient to take the mean temperature for each of the two extreme months of January and July, together with the mean temperature of the middle spring and fall months of April and October. To these is added the mean temperature of the entire year.

[Fig. 1. See diagram on subsequent page.]

The temperature section of the fortieth parallel constructed by me in this manner is herewith presented. The horizontal lines mark the degrees on the thermometer scale specified, corresponding to every ninth degree Fahrenheit and every fifth degree Centigrade, from the freezing point upwards and downwards. The scale adopted is ten degrees Centigrade to the inch. The scale of longitude adopted is sixty degrees to the inch.

On this diagram we first note the two great continents of America and Asia-Europe separated by the Atlantic. We see that the mean temperature varies along this latitude from about 48 degrees F. to 64, or fully 16 degrees. We also notice that it is highest throughout the European part of this section (Mediterranean region) and on the Pacific coast in America (California); also, that it is lowest throughout the interior and clear through to the east coast of the continent of America and Asia.

Now, such a difference of sixteen degrees in the mean annual temperature of a place corresponds in our valley of the Mississippi to a change in location from Iowa City to middle Louisiana. So large are the differences in the mean temperature on the parallel of forty degrees latitude North around our globe!

But the differences in thermic climate are much greater yet when we take into account the course of the temperature throughout the year. For we notice that as the mean temperature of the year is lower in continental regions, the July heat is somewhat higher, and the January temperature very much lower. From this it follows, as also plainly seen on the diagram, that the *range* from the mid-winter to the mid-summer month is greatest in

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the continents. These marked characteristics have led meteorologists to distinguish between continental and marine or oceanic climates.

Under the same latitude the marine climate is warmer, has a colder summer, and a much warmer winter than the continental climate; its annual range in temperature is very small. It is equable in character, and mild.

The continental climate is colder in its annual mean temperature; but it has a higher summer heat, and especially a much greater winter cold, so that its yearly range in temperature is excessive. It is a climate of extremes, and severe. The change from winter to summer is great, and usually takes place in a short time. Also the irregular changes from day to day are much greater in the continental than the marine climates.

By looking at the diagram we see further, that under the fortieth parallel of latitude south the climate of America and Australia is oceanic; that true continental climates we find only on the northern parallel of this latitude.

It will also be seen that Europe is especially favored, particularly under the parallel here considered. For about fifty degrees of longitude, from coast of Portugal to the shores of the Black Sea, the climate is essentially marine, though getting gradually more severe as we go eastward. This is due to the great extent of the Mediterranean Sea. The equable climate of Naples, where July is about equal in temperature to that of Iowa City, has a January like our April, while our January averages nearly thirty degrees colder; and yet Naples and Iowa City are nearly under the same parallel of latitude! The annual range in temperature at Naples is about thirty degrees. Here at Iowa City it is nearly sixty degrees between July and January.

The American continent has barely a western coast line of moderately marine climate, while on the eastern continent nearly all of Europe may be said to have a marine climate, which on every parallel of latitude very gradually passes into the continental climate of central Asia, the most pronounced and most severe continental climate on this globe.

Eastern Europe, that is Russia, forms the transition region from marine to continental climate of central Asia; on the west we have in Germany a more rigorous marine climate, which is decidedly moderate when compared to that of Eastern Russia.

[Fig. 2. See diagram on subsequent page.]

The temperature section given takes account only of the extreme and mean months of the year, and therefore must be supplemented by a diagram showing the course of the temperature throughout the entire year at prominent points on the fortieth parallel considered. Accordingly, I present such a diagram, constructed on a temperature scale of 20 degrees Centigrade to the inch, and a time scale of four months to the inch. I present the curves in three groups, namely, one for the Eastern Continent, another for the Western Continent, and a third for the Southern Hemisphere. All these curves are very carefully constructed on double the scale of the cut, from the best data given in tabular form at the close, and are therefore perfectly reliable.

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The curve marked "*Plateau*" is the mean of the values for Salt Lake City and Denver. The curve marked "*Iowa*" is the mean of Omaha and Leavenworth on the Missouri and Davenport and St. Louis on the Mississippi, thus representing a point under 40° 3′ Lat. N. and Long. 94° west of Greenwich; that is, a point on the fortieth parallel of latitude almost exactly on the middle meridian of Iowa. The curve marked "Iowa City" represents my twenty years' normal from 1861 to 1880.

These annual curves show most strikingly the equable marine climate of Lisbon, San Francisco and the Southern Hemisphere, in contrast with the excessive, continental climate of Peking and Iowa City.

THE CLIMATE OF RUSSIA.

In order to get a more definite idea of these relations, I have drawn the isothermal lines for January and July according to the great atlas of H. Wild, between the sixtieth and fortieth degree of latitude, and from Hamburg in Germany to Nukiss near the sea of Aral.

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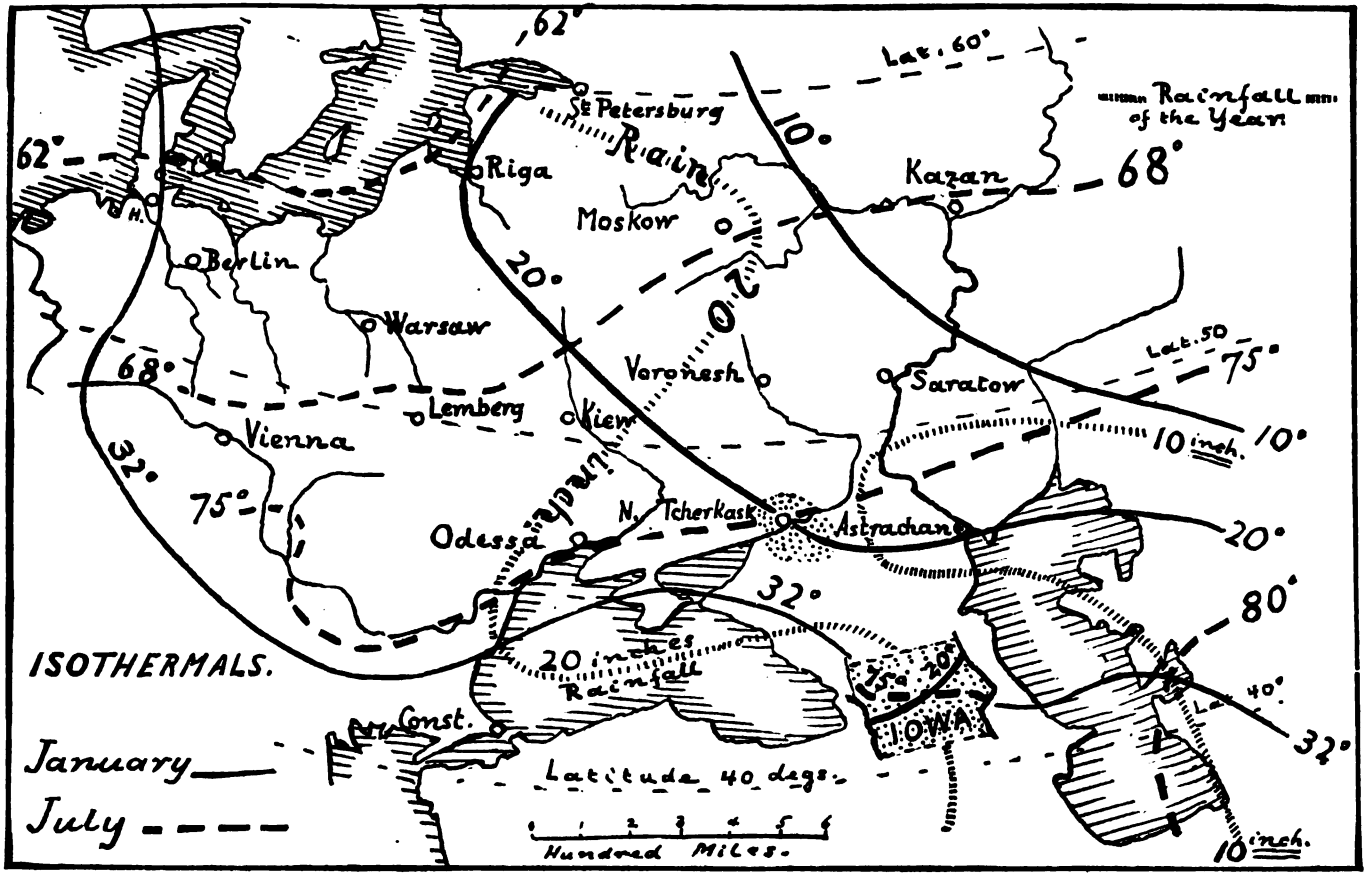
62°
Lat. 60°
St Petersburg
Rainfall mm. of the Year
10°
Rain
Riga
Kazan
68°
62°
H.
Moskow
Berlin
20°
Warsaw
Lat. 50
75°
68°
Voronesh
Saratow
Lemberg
Kiew
10 inch.
10°
Vienna
32°
75°
Rain
N. Tcherkask
Astrachan
20°
Odessa
32°
80°
ISOTHERMALS.
20 inches Rainfall
Const.
40°
January
July
Latitude 40 degs.
O W A
32°
Hundred Miles.
10 inch.

Upon examination of this map it will be seen that under the latitude of 55 degrees the yearly range in temperature increases from about 30 degrees at Hamburg to 60 degrees at Kazan. The first is truly marine, comparable to the yearly range at Naples; the last is strictly continental, comparable to that at Iowa City. The distance from Hamburg, Germany, to Kazan, East Russia, is 1,500 miles.

That the change from the marine to the continental climate is not abrupt, may be seen from the following table:

MEAN TEMPERATURE.

Latitude 45°	January.	July.	Range.
Hamburg	32	62	30
Riga	20	63	43
Moscow	13	68	55
Kazan	8	68	60
Latitude 55°			
Vienna	30	71	41
Odessa	26	74	48
Astrachan	20	77	57
Nukuss	20	80	60

I have given the temperatures only in the nearest entire degree Fahrenheit and selected noted places near the latitude specified and about five hundred miles apart.

It will be noticed that the January temperature falls from 32 to 8 degrees in going from Hamburg to Kazan, while the July temperature rises only from 62 to 68 degrees; that is, the mid-winter month is 24 degrees colder at Kazan, but the mid-summer month only six degrees warmer. In other words, the temperature of January is lowered four times as many degrees as the summer temperature is raised, while the range is exactly doubled. This greater change, winter than in summer temperatures will be recognized as the leading character in continental climates.

The changes under latitude 55 are less marked, because so much farther south; at the same time, it must be remembered that Vienna is already somewhat continental in its climate.

Before we leave this interesting map, I wish to call especial attention to the remarkable fact that both the lines of equal July and January temperatures cut the parallels of latitude under a considerable angle, instead of running nearly parallel thereto. The January Isothermals run from northwest to southeast, and winter cold increases most rapidly in the direction from southwest to northeast. The July Isothermals intersect the preceding almost under a right angle, at least in western Russia; accordingly, the summer heat increases most rapidly in a direction from northwest to southeast. Instead of north being coldest and south warmest, we thus see that in all southern Russia, northwest is the direction of greatest cold in the summer and northeast the direction of greatest cold in winter. But north-

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west points to the ocean and moisture, northeast toward the continent and dryness, thus causing specific climatic relations, peculiar to Russia, and not found in our Mississippi Valley.

On this map I have also entered the lines of equal rainfall according to *Wosikoff* (see Klimate der Erde, 1887, Vol. 2). It will be seen that just above the Caspian Sea, between Saratow and Astrachan, the rainfall for the entire year is only ten inches and less; that through all of Russia to be considered by us it is between ten and twenty inches only, reaching this latter amount on a line running from Petersburg over Moscow and Kiew to Odessa. The distribution of these rains throughout the year is similar to that in the upper Mississippi Valley, being greatest in the summer months.

CLIMATE OF THE UPPER MISSISSIPPI VALLEY.

Having made ourselves somewhat acquainted with the distribution of temperature and rainfall in Russia, we are ready to examine a corresponding map of the Mississippi Valley, drawn on exactly the same plan and scale. It is strikingly apparent that the isothermals cross the Mississippi Valley mainly in a direction from west to east; that, however, the great lakes cause the January Isothermals to bend north and the July Isothermals to bend south. This deflection is due to the immense body of water in these lakes, reducing the extremes, cooling the summers and moderating the winters, thus giving this part of our continent a somewhat marine climate. The peninsula of Michigan, surrounded on three sides by this inland sea, ought to show this influence the most; and so it does in fact. It is owing to this tempering effect the lakes surrounding it that Michigan has become the most successful fruit producing State of the Northwest.

[Fig. 4. See diagram on subsequent page.]

To show this tempering influence of the lakes I have constructed a temperature section for the latitude of St. Paul (45 degrees North) extending 1,250 miles west from the east shores of Lake Huron.

[Fig. 5. See diagram on subsequent page.]

The scale of this cut is 650 miles and forty degrees F. to the inch. The names below indicate the states and territories passed through by this parallel; the lakes are distinguished by vertical shading. The meridians at Fort Sully, Dakota, St. Paul, Minn., and Alpena, Mich., are drawn; so are the boundaries intersected by the parallel named. In order more readily to distinguish the monthly temperature section, they are drawn as full lines for the rising season from January to July, and in dotted lines for the falling season from August to December.

It will be seen at a glance that both winter and summer months increase in severity as we on this parallel of St. Paul travel from the lakes westward. From about 45 degrees F. in Michigan the range increases to about 60 degrees in eastern Dakota on the same parallel.

The domineering climatic powers in the Mississippi Valley proper are the immense body of hot water of the Gulf of Mexico in the South, having a temperature of about 75 degrees all the year round, and the vast expanse of

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continental British America in the North; and to limit the atmospheric battle-field between these two opposite powers to the Mississippi Valley, one of the grandest mountain chains stands in the west, and rests on a high plane gently sloping down eastward to the Mississippi river.

[Fig. 6. See diagram on subsequent page.]

A glance at our longitudinal temperature section of the Mississippi Valwill show the import of these facts more clearly. In the South, on the shores of the gulf, we have an annual range of only thirty degrees, as we found it at Naples. In the North, at Pembina, near the British line, the mean temperature of January is seventy degrees below that of its July temperature. Hence the temperature section from the gulf northward declines but little in summer, but is very steep in winter. In July, New Orleans is but fifteen degrees warmer than Pembina, but in January Pembina is fifty-six degrees colder than New Orleans.

There is probably not another equally large portion of the globe that has in summer as equable a temperature as our Mississippi Valley, and this temperature is high, and insolation intense because of the low, almost subtropical latitude. Right close to the south, the immense boiler of the Gulf is furnishing vapor; the heated continental expanse north causes the southerly current prevailing throughout the summer. These southerly winds carry the moisture of the gulf all over the Mississippi Valley, where it descends in fertilizing rains, normally in great abundance, making it the best watered valley in the world. The farther north from the gulf, the smaller the amount of rainfall—but even a thousand miles north of the gulf, in northeastern Iowa, we have normally yet an annual rainfall of one yard in depth! To speak of Iowa, right in the center of the Upper Mississippi Valley, as of an arid region, is to contradict nature; to compare Iowa, which normally is covered with about a yard of rain-water in the course of each year, with southern central Russia receiving only about one-third as much, is preposterous. Iowa is not one of those arid portions of the globe that receives only about an inch a month of rainfall, though some of our new teachers would have us believe that were sufficient. No, when the greater part of Iowa received only one and a half to two inches of rain a month, all her people complained of extreme drouth. The line of twenty inches of rainfall runs over two hundred miles west of Iowa.

In winter the great thermic gradient of the Mississippi Valley, is the real cause of the sudden changes in our weather. In this thermic contrast between north and south we have the true origin of our blizzards and cold waves. This great difference in temperature makes it possible for us to have a thunder storm in winter, followed in a few hours by a blizzard. The irregular changes of temperature from day to day, are accordingly much greater in the Mississippi Valley than in Russia. Our so-called cyclonic storms travel about twice as fast as those in Europe and Russia.

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SEARCHING IOWA CLIMATE IN RUSSIA.

The isothermals of the map being determined by Signal Service observations, are somewhat high; we may therefore take the intersection of the 20° January and 75° July isothermals as being in fact central in Iowa. Now, where in Russia will we find a district or province that has an Iowa July and January temperature, and thus would correspond to the climate of Iowa in this first and most important general condition?

To find this thermic Iowa in Russia we follow the July isothermal of 75° from Odessa on the Black Sea beyond Ssaratow on the Volga River, and also trace the January isothermal of 20° from Riga on the Baltic, past Minsk, Kiew, Charkow and Nowo Tsherkask to Astrachan on the Caspian Sea. Where these two isothermals intersect, we have that district of Russia in which January and July correspond in temperature to Iowa. This is near Nowo Tsherkask, just above the Sea of Azov. By examining the curves showing the yearly course of the temperature at Iowa City and Nowo Tsherkask we see that the mean curve of the temperature in these two places corresponds as closely as can well be expected for two so distant and so differently situated localities. Yet the climate of these two places is not similar in the other essential respects, as already explained in general; especially the rainfall is very much less at Nowo Tsherkask than at Iowa City. (See cut below.)

In order to give the clearest possible idea of magnitude, latitude and thermic relations of Iowa and Russia compared, I have drawn a map of Iowa true to scale and in its proper position in latitude on the map of Russia, arbitrarily locating it in the Caucasus as to longitude. The January and July isothermals are also drawn, and the map is dotted like its thermic counterpart around Nowo Tsherkask.

If it had been intended to obtain fruit trees for Iowa from a region of Russia most closely corresponding to that of Iowa, they should have been sought here. But the region specified is inhabited by Don Cossacks and Calmucks, not much given to raising fruit; they are admirable herdsmen and horsemen. No apple trees from this part of Russia have been brought to Iowa, nor have Prof. Budd and Mr. Gibb come near this region. When at Voronesh, the nearest to Nowo Tsherkask, they were yet about 400 miles north of the region which in temperature corresponds most nearly to central Iowa. In his narrative (p. 15), Mr. Budd remarks that "Dr. Fischer, director of the pomological institute at Voronesh, had not heard of some of the most popular apples of Kazan and Ssimbirsk, on the Volga." As Kazan is nearly 500 miles northeast of Voronesh, and has a January temperature six degrees lower, and a July temperature two degrees lower, than Voronesh, Kazan apples would probably not be important at Voronesh. A nursery man at Des Moines, Iowa, may not deem it necessary to know all apples doing well at St. Paul, Minnesota.

As these travelers have not come near any part of Russia in which the temperature corresponds to that of Iowa, we may try to determine how their Russian trip might thermically be laid down on the map of the upper

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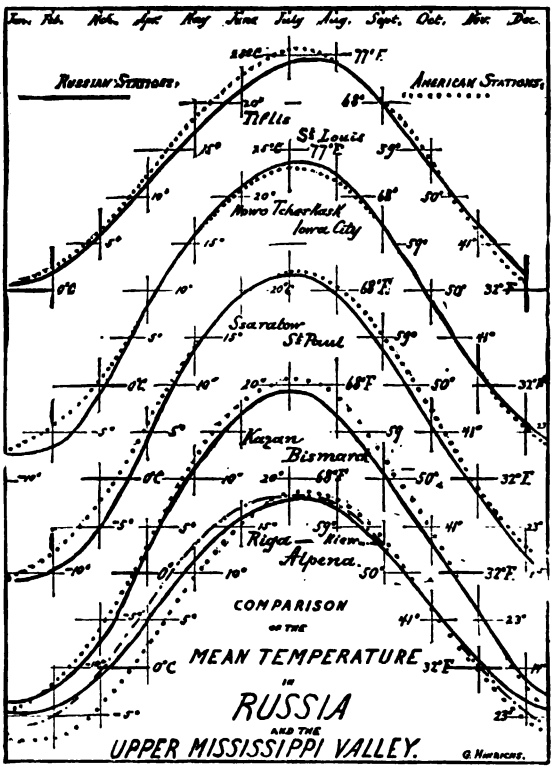
Mississippi Valley. By applying the method above used and exemplified, it will readily be seen that Riga and Kiew in Russia correspond to Michigan; Voronesh and Orel to northern Wisconsin; Ssaratow to St Paul, Minn., and Kazan to Bismarck, Dakota. The diagram showing the mean annual course of the temperature at these places shows, better than words could do, that thermically these places are very nearly equivalent. I may add that southward we have in both continents Nowo Tsherkask, corresponding to Iowa City, Iowa, and Tiflis to St. Louis, Mo.

But it should not be overlooked that this thermic equivalence does not, by any means, imply a general climatic identity, or even similarity; not only that even thermic variations differ notably, but, above all, in regard to rainfall, the two regions are really not comparable. What to us is a drouth, in Russia is a normal quantity. Eminent Russian authorities are well aware of this notable contrast. Says Dr. A. Woeikoff, in his work "On the Climates of the Earth," Vol. 2, p. 230 (German edition, 1887), "Drouths in southern



Russia are not uncommon * * * the reason is simply this, that there does not fall rain enough for so hot a climate;" and he proves it by comparing the temperature and rainfall of Lugan, Odessa and Kischinew, Russia, with the

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corresponding values of Iowa City, Iowa, and Ottawa, Illinois. The result of his comparison is that in these places of equal May and July temperature, the rainfall in the Mississippi Valley is two and one-half to three times as great as in the corresponding stations of south Russia.

CONCLUSIONS AND APPLICATIONS.

No wonder, therefore, that Russian plants have developed those thick leaves so often described, while plants indigenous to Iowa and the upper Mississippi Valley have not found it useful or necessary to do so. How these Russian plants will be modified by our much more moist climate, time alone can tell.

Plants possess a very considerable power of adaptability to climatic conditions not identical with those under which they originated and developed. Russia has a continental climate; so has Iowa and the Upper Mississippi Valley. Rains are mainly summer rains in both regions—scant in Russia, generally abundant in America. Changes in temperature from day to day are great in Russia, but much more severe in our part of America. Russia has the Buran—we have the Blizzard, which is not less. We may therefore expect to obtain many hardy plants from southern and middle Russia that will readily acclimatize themselves here and prove quite useful and valuable to us in corresponding regions.

But when we are told that fruit trees *will* succeed with us *because* they have been brought from such portions of Russia as correspond in climate to Iowa; and when upon closer examination we find that this Russian climate in some very essential particulars is not similar to ours at all, and that furthermore these plants came from Russian provinces that in thermal conditions resemble Michigan, Wisconsin, Minnesota and Dakota, but not Iowa; we are compelled to say that it is not at all certain and not even probable, that these fruit trees will do well in Iowa, and *we therefore must deny that the introduction of these fruits into Iowa rests upon a rational foundation assuring success.* On the contrary, it seems necessary that these fruits. so far as their quality be desirable, should be tested exactly as all others have been tested, namely empirically, by actual and sufficiently extensive and continued trial at as many stations as may seem advisable.

The comparisons of climate here made will, it is hoped, assist in selecting places from which to import Russian fruit for any given part of the Upper Mississippi Valley, so that the thermic change the imported plant will have to submit to may average as low as possible.

The importations thus far made of Russian fruit have all come from places in Russia having both a lower winter and summer temperature. *It is therefore not at all to be expected that winter apples imported from these places will be winter apples in Iowa*, if they succeed well in Iowa at all; not only on account of the higher summer temperature, but also on account of the greater insolation, due to much lower latitude, all these fruits must be expected to be much earlier in their new home than they were in Russia.

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But even if in these Russian fruit only new strains of hardy trees have been furnished our experimenters and breeders, much good will have been done to Iowa.

In conclusion I may repeat that personally I do hope that we shall be able to acclimatize some of the best Russian apples and other fruit. The present study of the climate of the two widely distant regions in question was demanded by the peculiar conditions of the problem. I trust that the results obtained will prove useful to the horticulturists of Iowa, and may aid in the work of growing good fruit in Iowa and the Northwest.

DISCUSSION.

R. P. Speer: I always like a good speech or a good paper, let the audience think as they will. I thank Professor Hinrichs for the paper, but there are some things in it that I do not agree with, but I will take my time for it and will reply to it at another time and in some other way.

J. C. Plumb: I do not think Mr. Speer will need to apply to it the same conclusions. If the climate of Russia resembles our own in some things it does not in others, and in that they are not similar.

R. P. Speer: I say similar but worse. If, for example, an apple tree in Russia will stand 57° of cold, it ought to stand here where the coldest I have ever known is 42°. If the varieties of apples of Russia stand their severe drouths there, they ought to stand our occasional drouths here. If they stand the extremely changeable climate of Russia, why not stand the changes we have here? I have fruited thirteen varieties of Russian apples, besides Duchess, Tetofsky and Alexander for several years, while our hardiest American varieties of Apples are dead. I have picked 1100 bushels of apples in a year from my orchard, but now all the trees are dead but Duchess, Whitney and one or two others. The Russians I have fruited are all right except two varieties. I do not think that the apples of the far north of Russia will do well here; but from the interior, more southern and dryer portions will be all right.

C. L. Watrous: I want to say a word about that part of the argument where they say that, because a climate is colder, or dryer, or hotter, that the trees that do well there, will succeed well here. Gray says that the vegetation of any region is the best means of judging of the climatic conditions of that particular locality. We lose sight of the difference of climate in the same country. The great geographical botanists have called our attention to these things, and when we come to compare Russia with Iowa, we find few points of resem-

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blance. In the Indiana Horticultural report, Morris Thompson says there are seven distinct botanical regions in Indiana. In the southwest part of the State, a few counties show in many respects a wonderful difference. He supposes that after the glacial period a few of the plants of that period survived, and have continued in certain ravines and sides of hills favorable to their growth, so that on one side of a ravine we find, as it were, the picket line of one Flora; while on the other side, we find the picket line of another Flora that extends to Hudson's Bay, and what is peculiar, they may not be found in country intervening until the swamps of the north are reached. Now, if there in Indiana a certain strain of facts, that we cannot dispute, exists, it shows that localities have surroundings and influences peculiar and not to be compared with other localities, even if they have a general resemblance.

Adjourned to 9:30 A. M. to-morrow.

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SECOND DAY—MORNING SESSION.

Grape Growing was introduced by Silas Wilson as follows.

MR. PRESIDENT—This is a topic on which there cannot easily be too much said. Grape culture in Iowa has not kept pace with other fruits, and it seems to me there is no fruit grown in the State that will reward a man more liberally for his labor bestowed than the grape. Deep planting, clean culture, close pruning and winter protection are indispensable in successful grape growing on the prairies of Iowa. It always grieves me to see Iowa supplied with grapes grown in Ohio or New York when they should be grown in Iowa; this, however, does not apply to Concords, for there is usually a fair supply of them on the market during the month of September, but the Iowa Concords go out, then the eastern grapes come in. We should grow more kinds and better keeping varieties. For early market, plant Moore's Early, Janesville, Worden, Cottage and Lady. For keeping and selling at good prices later, when the supply runs low, plant Delaware, Rogers No. 15, Salem and Wilder. Rogers No. 15 or Agawam is a good keeper, a good cropper, the best of the Rogers; it should be planted deep, the lower system of roots should be put down 18 to 20 inches deep, and when three or four years olds, hould be pruned close, cut back to two or three buds, and layed down and covered with earth before freezing weather. The Rogers should also be planted in alternate rows with Concord, Worden, or some other good fertilizing variety, as the Rogers are generally regarded deficient in pollen. The Delaware will flourish with same treatment recommended for the Rogers. I fruited last summer quite successfully twenty-seven varieties of grapes. My Moore's Early, Janesville and Champion commenced ripening August 14th, and Worden, August 18th to 20th, and our table was well supplied with fresh grapes for three months. Grape vines in vineyard should be kept off the ground and receive clean culture. It must be remembered that no grape vine can mature perfect specimens of grapes unless the ground be kept clean under the vines. Mr. President, when Iowa grape growers get down and give their vineyards the same care and attention that New England dairymen give their business, they will succeed, for seventeen years experience has convinced me grapes cannot be successfully grown in Iowa every year without proper care and attention.

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DISCUSSION.

G. B. Brackett: Cork dust is best to pack grapes in. It can be had of grocerymen and those who get fruit shipped from foreign countries.

C. W. Burton: I have heard it said that an attic was the best place to keep grapes, where they can get good ventilation.

G. B. Brackett: Grapes shipped from foreign countries are packed in air tight casks in cork dust, and will not get damp if put in a cellar.

Silas Wilson: Some have an idea that we cannot grow grapes profitably in this country, but if we give the same careful attention to the business that New England dairy farmers do to their business we will be successful. We have no virgin soil any more, and we must enrich the land if we want to produce the best results, we must renew and retain the fertility of our soil. The Elvira is the only variety that I have raised that will perfect five bunches to the cluster. Most varieties will only perfect two or three bunches.

C. W. Burton: Will it pay to cover vines with grapes at two cents per pound?

Silas Wilson: Yes, vines can be covered at a cost of $15 per acre, and will produce four tons of grapes. We want varieties that can be kept to supply the market after the Concords are gone. If New York can send grapes here, as they did last fall, at three and four cents, we *can* and *should* profitably supply our own markets. In winter protection, we want to prevent evaporation of the vines, by keeping soil in contact with them. If earthed up about the collar, and ends of vines covered, it is a great protection and will generally keep the fruit buds from winter-killing. Would set fifteen to twenty inches deep and when planting in a vineyard would plow pretty deep and would cultivate thoroughly. It will not hurt the vines to destroy some of the roots. Ground should be kept free from weeds. You cannot raise good grapes if weeds are allowed to grow. The Jefferson will not succeed in our climate. I place Worden at the head of the list for black grapes. Grapes need all the heat they can get in our climate, and thorough and clean culture. Early cultivation is very beneficial.

President Patten: Something has been said about fertilization of grapes. In the vineyard of Mr. Hunt, of Waterloo, Rogers No. 15 were planted in alternate rows with Concord, and in rows where Con-

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cord had failed they bore abundantly. The soil was only ordinary rich prairie soil, good for a corn crop.

Credentials of J. C. Plumb, of Milton, Wisconsin, delegate from Wisconsin Horticultural Society, were presented, and on motion Mr. Plumb was made an honorary member.

Committee on Arboretum reported as follows:

NOTES FROM ARNOLD ARBORETUM, BOSTON, MASS.

The Arboretum was commenced in 1870. A fund of $150,000 was raised by private donation. The annual available income is $8,000. Permanent planting was commenced in 1894. About two and one-half acres are planted each year. The material for permanent plantations is obtained by exchange with botanic gardens of Europe, Japan, etc., and with great foreign commercial nurseries. To purchase the material would be immensely expensive and impracticable without a very large fund to draw upon. To grow the native material for these exchanges they have a large establishment, with greenhouses, etc. To begin with a house 20x50 feet would be needful, cost about $1,500. A foreman would cost $1,000 annually besides a house for ordinary use, etc.

The least possible annual fund would be $4,000 or $5,000 to justify any attempt at an Arboretum. With only $1,000 or $2,000 the end would be the death of everything from neglect. An Arboretum needs also a museum of dried plants of wood specimens, etc.

At the Arnold Arboretum they have 165 acres of land. So far they have used between $30,000 and $45,000. With a sum not above $2,000 or $3,000, the result must be a bitter disappointment and regret to every one connected with the undertaking.

The result of our experience shows that American trees should be planted in America. If foreign trees succeed well in American soil it is an exception to the general rule. The exceptions may be counted on the fingers of one hand without using all the fingers.

These Arboretums are needed in every state; otherwise we are all as much at sea as are men in different countries. It is best to plant trees indigenous to the immediate region where the planting is needed.

These notes were taken down, in the Arboretum, from the lips of Jackson T. Dawson, the foreman.

C. L. WATROUS,
G. B. BRACKETT.

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In view of the foregoing facts, your committee beg leave to add to their report the following resolution:

Resolved, That the funds of this society do not at this time justify the undertaking of an Arboretum.

Motion that resolution accompanying report of Arboretum Committee be adopted.

DISCUSSION.

R. P. Speer: I looked over the ground that it was proposed we should have for arboretum, and have carefully considered the plans proposed. We can get grounds for nursery aside from the grounds proper for arboretum. I do not intend to allow this motion to pass without saying something. It is probably true that the Arnold Arboretum has expended a great deal of money, but I can do more with $100 of my own money, than has been done with $3,000 in Arnold Arboretum. The committee says, American trees for America, and I agree with them in that particular; they do not cost much money. I can gather up seeds and raise trees, and others would do the same. Even if we hired it done it would not cost much money. Neither do we need to wait fourteen years to begin. We could begin in two or three years. We could prepare the ground and raise some crop as of strawberries, and this would help to pay expenses. We would need a good man in charge constantly. I believe the time has come to start an arboretum—and here on the Agricultural Society's grounds is the place. I shall vote against the resolution, because the time has come that we should do something in that line. If we do not accept this offer now, in a few years the ground cannot be had in this way, and land near Des Moines will be very valuable.

H. W. Lathrop: It is not best for a laboring man to overload himself with work; neither is it best for us to undertake too much. We have got a line of work that is more important. We need the necessaries before we get the luxuries. If we have money to expend, let us expend it getting fruits; then after that we can spend money for an arboretum. If we start as proposed, there would be a man and team to pay for the year round. The strawberries would not pay any considerable portion of the expense of labor. I would not like to see an arboretum die in its infancy.

G. B. Brackett: I do not think Mr. Speer understands the magnitude of the work or the cost. Ten acres is not enough land. On that

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much land we could not get all the specimens of one species—the Oak for instance. Unless more ground can be had, do not think we should undertake the work at all.

John Wragg: Mr. Wilson has told us that it is proverbial that western farmers do things in a cheap way, and of course western men often slight their work; yet western men do things very much cheaper than eastern men do them. It will take time to make an arboretum, and no great outlay would be necessary at present. A few acres would be prepared, and a great many of our nursery men would be glad to grow a few trees. I do hope that the arboretum can be commenced in a small way, and after we show it to be a good thing, and an educational undertaking, our people will approve and furnish the means.

J. C. Plumb: I wish to ask a question. That is, as to whether you have made any disposition of the funds expected to be appropriated by the Hatch Bill?

R. P. Speer: The college board has appointed a committee to arrange for the application of the fund, when it shall be received.

Geo. Van Houten: If I understand the force of the resolution, by passing it we relinquish our claim to the land offered us for an arboretum. If we do not accept this offer, it is hardly probable that we will have a chance later to do so, or secure other lands as desirable. Real estate is advancing very rapidly near Des Moines, and it is probable that soon the desirable locations cannot be had, or if in the market the price would put them beyond our reach.

C. L. Watrous: If we take that land we assume an obligation to go ahead and improve it. If we do not intend to do it we ought to say so and let the Agricultural Society know what we intend to do. We are not in shape to undertake this thing. I do not understand that this society gets any land, it will belong to the Agricultural Society and they will get all the gate money.

R. P. Speer: The question was put to the board last fall as to title. The State owns the land, but the Agricultural Society would allow us to draw up the lease, and we could make the contract as strong as we desire; but, of course, if they cease to use it for a State fair, the title and possession will revert to the State; but as our society is a State institution we need not fear any danger from such reversion.

Pres. Patten: Allow me to express a thought. If we undertake to have an arboretum we should consider the idea that ten acres are not sufficient. Resolution carried.

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President announced committees as follows:
Fruits—Messrs. Thatcher, Fluke and Secor.
Resolutions—Messrs. Lathrop, Craig and Taylor.

Following reports were read:

REPORT DIRECTOR FOURTH DISTRICT.

BY N. K. FLUKE.

For want of time I have not been able to get over much of the territory embraced in the district, and will consequently be unable to make a very satisfactory report.

The unprecedented drouth which prevailed over the State the past year was not near so severe near the Mississippi river. We had several local showers at seasonable times, so that our small fruit growers marketed a fair crop (of such fruits as was not hurt by the previous hard winter) at fair prices.

On the 10th, 15th, 23d and 29th of May, and the 1st, 4th, 18th, 21st and 31st of June, and the 1st and 2d of July we had showers, four or five of them being good ones. With these opportune blessings our strawberries and raspberries were abundant and fine.

A microscopic insect made its appearance or was first noticed last summer on our strawberries. It attacked the blossom, apparently feeding on the pollen, so that in some places the plants were infertile with occasional crooked and half-formed berries. There did not seem to be any difference as to the ravages of their work in old or new plantations. Fears are entertained that they may become a serious enemy to this, our easily raised and most luscious of fruits.

Blackberries were a complete failure, not having any appearances of being injured by the winter, they bloomed very freely and set a big crop, but with the best cultivation, and the showers to help, were small and almost worthless. The Snyder is the only one generally planted, but without protection they will occasionally fail.

Grapes were abundant and of the best quality. In a few localities the rot made its appearance in the early stages of growth, but was soon dried up by climatic conditions.

Along the Mississippi bluffs they find a genial home, and are successfully grown as a paying crop. The surplus not needed here has generally found a good market north and north-west of us.

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The past season there was grown and shipped from our side of the river over sixty-two tons, and from Rock Island about fifty-one tons. About eighty-five per cent. of the grapes grown are Concords. Prices ruled low, the average would be about 2¼ cents net per pound through the season.

Cherries bore a light crop about half enough for the birds. The Richmond is the only one that was planted for market. The old trees being nearly all gone, and the remaining ones so injured that they are worthless. Growers are becoming discouraged, and I haven't heard of one that is planting again in any quantity for market in our section.

The plum crop in the eastern part of the district was very fine. In a few localities were injured by late frosts, but when not injured, and kept clear of the curculio produced a large yield. Cultivated varieties, as Forest Garden, Weaver, DeSoto, etc., brought from $2 00 to $2 50 per bushel.

The Wild Goose is a good plum, but a very bad one to split down. Nearly all the older planted trees of this variety have perished from this cause.

The few varieties of apples left us—Duchess, Fameuse, Hawthorndon, Roman stem, and Willow, set a full crop, but on account of the great number of insect enemies, a very small proportion were fit for market.

The markets were poorly supplied during the summer and fall months, as the fruit-growing regions near us, Michigan and Missouri, were as badly off, and none to spare.

Prices ranged from 75 cents to $1.50, and from $1.75 to $2.00 a bushel for fancy, well-colored stand apples.

One of our commission men went to Canada last fall and packed and shipped to this point over 5,000 barrels of the finest apples it has been my lot to see—Greenings, Rambo, Yellow Belleflower, and other varieties common to Northern New York, a large proportion of them being Northern Spy. They are keeping remarkably well yet. The Michigan apples were very wormy and small.

Last fall I noticed an apple of good size and fair quality in market, which I was not acquainted with, which proved very salable. On inquiry I found where they were grown, and went to see the trees. The owner said they were from a New York nursery and were planted about twenty-five years ago. Of the orchard planted at that time all were gone but the two trees of this variety. To judge from their appearance they are as hardy as the Hawthorndon, and much better in tree than the Fameuse. He says they are good bearers, he having marketed thirty bushels of fair fruit from the two trees this year.

I sent a few specimens of the fruit, with some other kinds to Mr. Brackett (of our society) for identification.

In this way we may occasionally pick up a variety which has the qualifications we desire—adaptability.

I append a few notes from my friend, C. P. Osburn, of Fairfax.

FRIEND FLUKE—Yours of the 28th inst. is at hand, asking me to inform you as to fruits the past season in this part of the Fourth District.

There was a fair crop of strawberries, also of raspberries, a fair crop of Duchess apple, a moderate crop of Fameuse, and a very good crop of grapes.

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Of winter apples only Willow twig bore many apples. One young orchard, a few miles from here, bore nicely of Ben Davis, Pewaukee, Janet, Roman stem, Iowa Blush, etc. I never saw nicer fruit than was on that orchard. I sold the owner of it the trees six years ago.

I think we have a fine start in varieties of small fruits. As to cherries and apples we are passing through the chrysalis state, what will be the ultimatum is more than I can tell, but I have confidence to believe we shall have some good apples yet. Yours Truly,

C. P. OSBORN.

REPORT OF DIRECTOR OF THIRD DISTRICT.

BY A. F. COLLMAN.

I have taken considerable pains to make my report as near accurate as possible. And I find the fruit crop through the district was fair. The apple crop was better than for several years. Some kinds bore a heavy crop, while nearly all kinds, that had any vitality left, bore some fruit.

I find in Harrison county on the dry lands Ben Davis and Jonathan bore a heavy crop of fine fruit, taking the lead.

In Pottawattamie county, near the river, the Ben Davis is doing well and still taking the lead, while in Cass county the Ben Davis has gone where the woodbine twineth. Montgomery, Page, Mills, Fremont, and in some parts of Taylor county, the Ben Davis is doing well, while in Adams county, with the exception of some favored location the Ben Davis has had its day.

I find the Duchess all through the district lifting its head away above all the rest, still healthy and bears a full crop every year. Lowell, Dyer, Porter, Grimes' Golden, Janet, Haas and Fall Orange are doing well all through the district.

Nearly all the fruit men in my district that have tried the Russian varieties and are not prejudiced against them, have great hopes for them. And we hope to find among the many Russians, varieties that will prove fully as hardy as the Duchess, and as good keepers as the Janet or Ben Davis.

Nearly all the plums that are on the hardy list are doing well, but think from the reports that the Wild Goose is taking the lead. Friend H. A. Terry, writes me about the Hawkeye plum, and pronounces it at the head of the hardy list. I have not seen the plum, but from what I can learn about the Hawkeye it should be tried by every fruit man in the State. I have great confidence in Mr. Terry, and think he would not misrepresent it.

Grapes bore a good crop, Concord and Worden taking the lead. We have several new varities that are very promising, and think that in the near

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future we can report some of our fine grapes in this society that will be fully equal to any of our California grapes.

Among the raspberries, the Shaffer takes my eye. It is the largest on my ground, and is taking the lead all through the district where tried. I would caution planters against buying it of bummers, for you know they will sell it to you if they have to fill the order with Turner's Red.

Currants all do well through the writer's district where the ground is kept very rich.

Our strawberry crop was good, Crescent still taking the lead. But we have great hopes of the Jewel, Buhach and Jessie.

Blackberry crop was light and very poor in quality, owing to the dry weather. Snyder is the only one left. We hope to find some of our dewberries that will take the place of the blackberry.

I find timber planting greatly neglected. Our people seem to put it off for a *more convenient time*. I fully believe that if every farmer would plant from five to ten acres of some valuable timber on his farm, *Iowa* would be the *garden* of the *world*. I think the day is not far distant when Iowa will be one of the best fruit states in the universe. Iowa seems to be just the home for our fine evergreens, the European Larch. Red Cedar, Green Ash Catalpa, Butternut, Black Walnut, Sweet Chestnut and many other natural trees that we could mention.

I hope the day is not far distant when the influence of our society will be felt around every fireside in our state, and our horticultural writers will all contribute to some leading journal and make it, and our society, an educator for our people.

DISCUSSION.

J. Thatcher: The Wild Goose plum gives the best satisfaction of any we have. Mine are on their own roots. I trim up the sprouts and at two years old set them in nursery rows and the trees do well.

R. P. Speer: I cut down the last of mine last year. They were fourteen years old. I have not had a handful of fruit from them. They will not do well in our latitude.

N. T. Case: I think circumstances and nomenclature will explain some of the difference in reports on certain kinds of fruits. When we get to the bottom we may find that some were not true to name. With me the Wild Goose is not the best to bear, but when grafted on the wild plum does reasonably well. Plums on peach roots do not succeed with me. Those on wild plum stocks do much better. They will not overgrow and break off as some suppose.

John Wragg: Mr. Thatcher says, if Wild Goose are trimmed up well they will not split down. This is true of all our trees. If headed high they will not split, but if headed low they will split.

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A. F. Collman: I planted my first orchards in Adams county in 1872, and planted wild Goose plum trees in 1873 or 1874, and have had plums every year since, and they are always a success. I am sorry I cannot agree with friend Wragg. When I commenced orcharding, I headed trees three or four feet high. I find that high headed trees are most sure to lean over to the northeast, and in March they sunburn. Even if top is leaned the other way, if heads are high the trees soon lean to northeast. I had some pear trees broken down, and they threw out branches and made heads six to eight inches from the ground. They have lived and borne pears, while the balance of the row, of twenty-five trees are dead. I thought if it was good for pear it would be for other trees, so I have since headed low and my trees are bearing good crops.

N. K. Fluke: Mr. Collman lives in a different district, and while they (the Wild Goose plums) may do well with him, they do not do well in other places.

President Patten: The statement that the Wild Goose plum does well in southern Iowa, and bears fairly well at Des Moines and elsewhere, but not as well as further south, with the fact that they are too tender for northern Iowa, explains the habit of this variety as to hardiness.

Adjourned until 2 o'clock P. M.

AFTERNOON SESSION, SECOND DAY.

A letter from Father Clarkson was read, stating that owing to temporary sickness, he was deprived of the pleasure of meeting with the society.

Charles Patterson, of Kirkville, Mo., was on motion elected to Honorary membership.

C. L. Watrous, director of Sixth District reported as follows:

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REPORT OF SIXTH DISTRICT.

BY C. L. WATROUS, DES MOINES.

The summer of 1887 will be long remembered in Central Iowa, as one when Mother Nature usually so beautiful withheld her kindly favors. Such a drouth has not been known since the occupancy of the land by civilization.

We shall not therefore despair or complain at one—I was about to say failure, but it was not a failure—at one season when we gathered so much less than had been expected.

Many apples were grown especially in the southern part of the district. In Warren county, near the timber of the Des Moines and other rivers, nearly all the old list did fairly well. On my own place near Des Moines, many old sorts are in fair health and fruitage.

Of winter keepers, Willow twig, Rawles Janet, Sheriff, Grimes' Golden, Tallman Sweet, and several others look fairly well, while about half the trees of Ben Davis bore some fruit. Among earlier sorts, Fameuse, Early Joe, Plumb's Cider, Lowell, Cole's Quince, Haas, Sops of Wine, Yellow Ingestrie and Kirkbridge White, stand better than Red Astrachan, and about as well as the Oldenburg, only one tree of which has failed. Among Cherries, Early Richmond has so far proven most profitable with English Morello next. Montmorency has not been long enough on trial to afford a decisive opinion.

Marianna plum on its own roots kills to the ground. Top worked on Miner, it is perfect but has not yet fruited.

De Soto and Forest Garden have borne abundant crops, much of which has ben lost by premature rotting. Wolf and Rollingstone are too new for certain knowledge. Wild Goose and Miner, planted near native seedlings, always bear a crop of fair fruit which does not rot or drop prematurely. I think Miner has brought us most fair fruit of any sort, under such circumstances.

Among grapes for family use experience has shown that when laid down and covered with earth in winters, Agawam, Salem and Lindley—all Rogers' hybrids—have given us most satisfaction, unless Worden should be excepted, which is doubtful, because its season is so much shorter than those last mentioned.

Among raspberries, Gregg, Souhegan, Tyler, Shaffer, Turner, Cuthbert and Thwack are reliable and satisfactory.

The season was too hot and dry for currants and gooseberries and almost so for strawberries. Nothing wonderful has appeared among any of these.

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The drouth has shown the advisability of early transplanting evergreens. Of all sorts transplanted early there was no conspicuous failure except Balsam Fir. The past extra dry seasons called renewed attention to the infirmities of this most beautiful American tree, when exposed to great heat and lack of moisture.

Its home is in a cool and moist climate, and each year only confirms the suspicion with which it should be regarded in a distinctly prairie region. If men would only learn to let the Fir alone in the prairie region and use white spruce grown naturally on the borders of that region, far better results would be obtained. The Red Cedar from Nebraska and Colorado seed, is a fine example of the advantage acclimated trees have over the natives of different botanical regions.

In reply to the letters of inquiry sent out to Horticulturists in the district only two answers were received. A. J. Graves of Ames, writes that Willow-twig and Roman Stem apples bore some fruit but that everything else, great and small was destroyed by the drouth.

From Ex-Director Wragg we have a valuable report which I read and submit as a part of my report.

All others failed to respond.

Hon. C. L. Watrous—Horticulture in the Sixth District has had a back set by reason of the past dry years, and it, the drouth, was perhaps more intense through the center of the district on a line due west from Des Moines, than in most places, still the people are not discouraged, but will I think, if the spring shows an average amount of rain fall, plant more trees than have been planted for some years. Of course the main question is what shall we plant in fruit trees; shall it be the best of the old varieties, or the new ones that are as yet untried but by the few? The south half of the district and west of the west line of Polk county can and do raise many of the varieties on the old list with tolerable success, and will still plant Willow, Ben Davis, Grimes' Golden, and trees of that grade of hardiness. In the above mentioned part of the district a half crop was raised the past season but in many cases they were smaller than common, as the effect of drouth, and ripened too early to keep well. One thing I noticed in regard to Romanstem, the fruit was larger than common. The older cherry trees are nearly all dead or dying, of the old sorts, and there will be a scarcity of fruit for some years, till the younger trees come into full bearing. Plums were nearly a failure, but in isolated places there was a good crop of wild ones, generally where the grove had been cleared and was near the house. Grapes were a good crop where the vines had been protected. This is the only way to insure a crop. Strawberries, as a rule, were too much affected by the drouth to make more than one-third of a crop, but in some localities that had timely showers they were fair. The Crescent leads in productiveness. On the grounds of W. H. Lewis at Winterset there is an exception; here the James Vick has found a congenial soil and is *the* berry. Raspberries and blackberries promised a good crop, but were dried up. The Shaffer is growing in favor where ever known. The Ohio is gaining in

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popularity. Dewberries have not been grown long enough to decide as to their value, but I am favorably impressed with them. They will stand drouth better than blackberries. The drouth was very disastrous to newly planted small trees and plants, as the roots were too near the surface. Young trees planted previous made a fair growth. The loss was especially severe on young evergreens, the writer losing about sixty thousand, mostly forest seedlings. The three standing drouth the best were Scotch Pine, White Spruce and Red Cedar. Trees and plants went into winter quarters in good condition, there being sufficient moisture near the surface to carry them safe through the winter. As for the future, let us "thank God and take courage" and be sure and keep our "powder dry."

Yours,

J. WRAGG.

Waukee, January 6, 1888.

DISCUSSION.

J. Thatcher: There is one thing in these reports worthy of attention, and that is that the Romanstem Apple is coming to the front wherever grown. There is more demand for it over the State now than any other variety, not even excepting the Russians.

C. F. Gardner reported on Theory and Practice in Transplanting Evergreens, as follows:

EVERGREENS, TRANSPLANTING, IN THEORY AND PRACTICE.

BY CHARLES F. GARDNER, OSAGE, IOWA.

The removal of growing plants from one situation to another has been practiced from time immemorial. It cannot be supposed that I can give any new ideas on this subject. All that I can do is to give some of my impressions that have been produced on my mind by many years' experience in planting coniferous plants. No single rule can be given that will apply to every case. The true theory of transplanting, in my judgment, is as follows, to-wit: The natural proportion of top and roots must be preserved, cut off as much of the top as is necessary to counterbalance the loss of the roots. The roots must not be exposed to the action of the sun and atmosphere for *any* length of time, must be always kept moist. The tree should be set but little deeper than it grew. The earth must be well firmed, so that the tree will stand almost as solid as before its removal. Persons who understand

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the habits and nature of evergreens can move them with impunity at any season of the year when the ground can be worked freely. Some writers make an exception to this, excepting the months of July and August, in this latitude. I make none. So much for theory.

The next thing is to apply this theory to practice. As regards pruning, it must not be neglected, no matter if they present an unsightly appearance for a year or two; dormant buds will spring forth, and the whole top will soon be clothed with a rich foliage. Most evergreens have a resinous sap; this sap in its natural state is thin and limpid; when it is exposed for a short time to the action of the atmosphere, it becomes thick and turgid, a gum in fact; further exposure and heat produces resin. Once thickened by exposure it ceases to perform its functions as sap, no subsequent watering will ever revivify it.

I have seen it recommended to plant trees deep for the purpose of being a stay for the tree. To prevent its being swayed to and fro by the wind, in my judgment, however, it is much better to plant just a little deeper than the tree stood in the nursery, or forest, and reduce the top to gain the point desired.

I wish to speak particularly of the method of firming the earth around large trees. In standard works on this subject we read about placing the earth in its proper place with the fingers carefully placing each root in its position, and fingering the earth in the interstices. Now, the fact is that it is almost impossible to do the work well in this way, while there is another way to do it better and with one-tenth the work. Dig the hole as is generally recommended, fill it half full of water, throw in fine earth, mix it well, keep throwing in fine earth and mixing it together until you form a mortar about as thick as very thick paint; into this set your tree, and throw in some fine soil, enough to cover the mortar, gently pat it with the back of the spade, and let stand for half an hour, then fill up the hole with earth. In this way the tree is almost as solid as it was before it was removed. Always leave the top layer of soil loose, so it will not bake.

I have said that I make no exception to the months of July and August. The reason why I do not is because I transplant during these months with complete success. The later the season, however, the greater the care that the roots are not exposed. If the tree is transplanted after the new growth has attained a considerable length, it is necessary to cut it off. Cut it back to two inches, or less; many losses occur from lack of proper pruning. I think that the Cedars and Arborvitæ do better transplanted during those months than earlier in the season, but under no circumstances neglect pruning them. The best time to prune them is just before they are dug; if not done then, as soon thereafter as possible. Where it is possible, I prefer clean cultivation to any other method. The second best plan is mulching with straw, hay or leaves, when they can be procured without too much expense. Very small trees should never be planted on lawns, or on grass ground; for such places the trees should not be less than three feet high, after pruning. After all that has been said on this subject, I am

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aware that the majority of nurserymen can not carry out this theory except in his own planting. A customer orders a tree of particular size and shape; if the nurseryman shears that tree as it should be sheared, before shipment, the customer will not take it; he considers it spoiled, ruined, would not have such a tree on his ground if you would furnish it for nothing. The consequence is that the nurserymen ship their trees without pruning and give their customers good advice about doing so after they receive them. In nine cases out of ten this advice is not followed, and the result is that the trees, if they live at all, linger between life and death for several years before they can recover from the effect of having a preponderance of top. This method of procedure also causes the nurseryman to receive the curses of his customer instead of his blessing.

I have by way of experiment set out Scotch Pine, five to six feet high, cutting back the top to three feet and shortening in all the side branches, all the roots (laterals) cut back to two inches. In no case have I lost a single tree by such treatment, and the way the dormant buds will spring forth will surprise one who never made the experiment. Of course the more roots left on the tree the better will be the result.

The three most important points to observe are, keep the roots moist every second of time while the tree is out of the ground; have the top cut back to correspond with the loss of roots; and have the tree well firmed when set.

DISCUSSION.

John Wragg: I would like to ask Mr. Gardner the best kind of evergreens, all things considered?

C. F. Gardner: Scotch Pine is best for windbreak. It makes more top than any other variety in same length of time. The Norway Spruce is nearly as good.

John Wragg: The reason I ask this question is, that some have recommended White Pine as being superior to Scotch Pine; but I think the Scotch Pine the best. I have noticed lately, during the last cold spell, that the White Pine leaves seem to shrink and lay up close together, while the Scotch Pine stand out, and present full resistence to the wind. I would plant other varieties, but for first ten years the Scotch Pine is much the best windbreak, and that is what farmers need. Norway Spruce hold limbs and foliage close to the ground, and an admixture is better than one kind alone.

C. G. Patten: In my experience I must differ with these gentlemen. From a trial with Scotch and White Pine, planted about the same time, I find that after fifteen to eighteen years the White Pine maintain their limbs and foliage, while the Scotch Pine lose their limbs. While the Scotch Pine will make a good windbreak, it is but

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a scrub at best, while the White Pine has a value that Scotch Pine never can attain.

C. L. Watrous: This demonstrates that many foreign trees may do better at first than our native trees. For first twelve or fifteen years nothing makes a better shelter than Scotch Pine; but after twenty years or so it ceases to grow up, and limbs cease to shoot out two or more feet each year. It fails of vigor and grows old, while White Pine is in vigor, and becomes more and more perfect, and we do not know when old age will come. At Chicago Nurserymen's Convention, Robert Douglass said that he did not know of a Norway Spruce forty years old that was not suffering from old age. So after a long time has elapsed, that the trees acquire age, our White Pine is so far ahead of the others as to be no comparison between them. Many ornamental trees brought from Europe seem to do better for a time than our native trees, and grow for a while with great vigor, but our own native trees are more perfect in the long run.

N. T. Case: If terminal shoots of White Pine be clipped out, a few successive years, they will make incredibly dense tops.

John Wragg: I do not see that Mr. Patten disagrees with me. At first, the Scotch Pine is the very best. When a person is planting for shelter he wants results in a short time, and that is what he can get from planting the Scotch Pine. White Pine and others can be planted to take its place when the Scotch shall have failed. We have been talking about *picea pungens*, but the White Spruce will compare favorably with it. Down near West Branch are some very fine specimens of White Spruce. I thought that they must be Menzies Spruce. The White Spruce are nearly all fine trees, while only about one in a hundred of Menzies Spruce are very fine; many of them are no better than Norway Spruce.

C. L. Watrous: We should propagate our best evergreens by grafting. At the Arnold Arboretum they bring their evergreens forward in green house; they then graft a young slip and keep them in green house until the union is somewhat settled, and then set away until time to put out in the spring. A hot bed will do to start them, and we should propagate the hardy and beautiful kinds in this way.

A. F. Collman read a paper on nursery propagation, as follows:

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NURSERY MANAGEMENT.

BY A. F. COLLMAN.

MR. PRESIDENT—My subject is old and nearly thread-bare to the most of the members of our society, and yet practical men learn, or should learn, something new every year. Of late, budding seems to interest most of us. The traveling tree peddler has found a remedy in days past against root killed trees, blight, and in fact every thing that has been a hindrance to an abundance of fruit on every table. And just now he has struck oil by telling the dear people just one *thing thou lackest*; buy budded apple trees of me at twenty-five to fifty cents, and you will succeed. When he could get a good grafted tree of most any reliable nursery man for ten cents, that is worth at least ten times as much. In my opinion, this budding apple tree business is a grand humbug. I think more time and money will be lost to our planters than any other humbug that has ever been practiced on them. We know that not more than one seedling in a thousand is hardy enough to stand our Iowa winters, and when you bud ever so hardy a variety on a tender stock your tree is worthless, where as if you graft a section of the root with the said hardy variety your tree will be a success. For instance, our peaches are all tender, but graft a plum on a peach, and set the peach below the surface, and the peach will make a good root and last a long time.

I have not got far enough along to discard the graft room.

I like to use rather a short root and a long scion; root about three inches long and scion 5½ to 6 inches long. To do a good job I would use strictly first class roots and good full cut scions. Keep the roots fresh and lively, and the scions a little dryer, so the root will start the scion. Great care should be taken to keep the union from drying. Would pack away immediately, tie in bundles of 100 and pack in moist sand. I have tried nearly all kinds of packing material, but like sand best. What packed in sand last winter all came out in fine shape Set the grafts as early in the spring as possible, and work as soon as the grafts start and keep the ground loose and the weeds all out. By such a treatment the trees will stand from 5 to 6 feet when two years old and be ready for market.

Would bud cherry from 25th of July to 15th of August. Bud as near the base as possible, so you can protect them with earth the first winter.

Currants and gooseberry cuttings should be cut in the fall and set immedi-

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ately, or tied in convenient bundles and buried in cellar or in open ground and kept from frost during winter, and set early in spring, ground worked thoroughly.

Grapes can be grown successfully by the same treatment. Snowballs, Wiegelia and nearly all our hardy shrubs are grown from cutting by the same treatment or from layers.

DISCUSSION.

F. W. Taylor: One thing will create a wrong impression if left unexplained, and that is the 50 cent budded trees.

A. F. Collman: We have agents in our county who are taking orders for budded trees, claiming that only budded trees are reliable; but they fill the orders with trees that have been cut off at the ground and allowed to grow up again. Of course these trees are no better than trees that have never been cut off, but this process makes them look like budded trees, and enables the agents to fix up a nice story.

John Wragg: They have been through this country all around. One correspondent in the Prairie Farmer called on me by name to answer as to the value of budded trees, and I wrote giving the facts about as Mr. Collman has told us. The agents say that budded trees are all right and grafted ones are all wrong. While the fact in the case is, that much of our damage is below where the bud would be, and if on tender stock they would freeze to death, while trees grafted in root would root from the hardier scion and would live.

A. F. Collman: I have experimented with different sections of roots in grafting. The first sections and the larger roots will make grafts grow best, on the same principle that large potatoes make stronger sprouts than smaller ones.

Geo. Van Houten: The question of budded trees comes up each year, and as there is lots of swindling done, we should each year do something to warn and protect those who plant trees. Those who cut down their trees at one or two years — making them, after they grow up again, look like budded trees, no doubt sell better trees than if they were really budded; but as they, by this misrepresentation, sell a fifteen cent tree at 25 to 50 cents, it is a swindle. Until we can get hardy, reliable stocks by root grafting, budding cannot be reliable, for the apple, as our best seedlings are unreliable. It is claimed by some that people do not heed our warnings and will be swindled any how; but it is none the less our duty to state the facts, and then if people allow themselves to be swindled it is not our fault. We should do our whole duty in the premises.

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A. F. Collman: While talking on this subject, another matter might be discussed. There are in our orchards many varieties that are comparatively worthless. If we would top-work them with desirable kinds that would do well, it would be an advantage.

John Wragg: I am glad Mr. Collman brought this subject up. Something was said yesterday in regard to a crab that Mr. Fluke has, that is said to be an excellent stock. It seems to be suitable for a great number of varieties. Dyer, for instance, might do well on hardy stocks like Haas or Gros Pomier, which is hardy, but not of desired quality. But most of the damage to our trees occur in the forks, so what advantage will it be to graft varieties that injure in the forks, in the ordinary manner of top-working. The better way will be to plant hardy varieties, and let them grow until the heads are in proper shape to graft in the limbs. Thus we can get a grade of hardiness that we cannot get by grafting in the main stem, but people will not pay the enhanced price that it would require to get such trees; but if we are going to graft in the top at all, think we should graft in the limbs, instead of the main stem or trunk of the trees.

A letter was read from N. E. Hansen, in regard to a Thesis paper on Cross Fertilization.

The secretary stated that the paper was at hand and was probably a very valuable paper, but as it was very lengthy (95 pages of legal cap), it might not be possible to publish it under rules that the report be limited to size of last volume.

On motion the paper was referred to Committee on Publication.

R. D. McGeehon read a paper on Best New Small Fruits.

NEW SMALL FRUITS.

BY R. D. MCGEEHON.

As my name is on the programme for a paper on New Small Fruits I hardly know where to begin, for what *may be called* new fruits in one locality would be considered *old* in another, especially in a fast age of multiplied new things like the present.

I would first make the assertion that (up to this time), nothing that has yet been *well tested* in the line of strawberries can compete with the Crescent

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for bringing in dollars and cents; and I believe that is what most of us work for—and it is only nineteen years of age—and it takes about half of nineteen years to disseminate and test a fruit of even as quick growth as the strawberry, and do it with any degree of certainty. I have tried in the last eight years to test about every new strawberry that came prominently before the public, and for fruiting purposes I have got Crescent, Windsor, C. Jack Downer, Mt Vernon and Cumberland. I grow others for the plants, for other people who may want them to fruit in other localities, where they may do better than they do for me. I have entirely discarded the Bidwell Piper, Jersey Queen, Minor, Sharpless, Hart's Minnesota, Finch's Prolific, Longfellow, Warren, Big Bob, Cornelia, Old Ironclad, Mrs. Garfield, Dan. Boone, and scores of others, not because they had no merits, for every one of them possessed some good qualities; but *none* of them (on my grounds) would bring dollars and cents enough to pay. Four years ago I received two new varieties from Bismarck, Dakota, said to be the only ones that would stand that climate and bear good crops of fruit (excepting Crescent); one was called Bismarck, the other, Dakota; said to be seedlings--(I think of the Crescent) they are about as hardy as bluegrass, good growers, and make plants equal to the Crescent, set *enormous* crops of berries, but don't seem to be able to bring near all of them to perfection; the fruit (as grown in thick, matted rows), is about the size of Crescent, but I don't consider the quality equal, for Iowa; I don't consider them valuable—they may be of value in north Dakota; one is pistillate, the other staminate. The Jewell I have fruited but one year; I am not very favorably impressed with it; with me it is a poor grower; it makes *very few* new plants, some of the old plants making only three to five new ones; it is fairly productive; the fruit is of large size, handsome, and fair quality, but unless it grows better in the future, and makes more plants, it will not be satisfactory where we grow strawberries in matted rows. I am testing May King, Belmont, Itasca, Bubach No. 5 and Jessie. I have not fruited any of them yet, hence can say nothing about their fruiting qualities from my own experience, but so far as growing qualities, healthiness, and ability to stand hot sun, hot winds and drouth is concerned, I consider that Jessie and Bubach No. 5 about perfect. I think a plant that would retain perfect foliage and grow right along such a summer as last summer, would grow almost any season under any conditions that we are likely to have. It is not necessary for me to tell you what they have done in Illinois or Wisconsin, their native home, as almost every one that reads horticultural literature knows about as much about that as I do. Of raspberries, the Tyler, for an early Blackcap, is the best I know of, being hardy and healthy, a good grower and bearer; Souhegan is almost identical, but, I think, not quite so productive. I have now tested the Ohio long enough to satisfy me that this is one of *the very best* that has yet been introduced for a medium or late berry. It is one of the hardiest and most productive on the list; the fruit is firm, of good size and good quality. The Shaffer is neither black nor red, but the fruit is generally classed with the red; the fruit sells in our market for more than either. I consider this one of the most profitable we have; the fruit is very large;

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sometimes seven-eights to one inch in diameter; when fully ripe it is a purplish red, with purple bloom, rather soft to ship far; sub-acid in flavor; when canned, one of the best flavored raspberries we have, either black or red—an excellent bearer; it produces the largest canes of any raspberry I know of, and stands our hard winters about equal to any. So far as red raspberries are concerned, I have tried Lost Rubies, Hansel, Crimson Beauty, Superb, and several others, and plowed them all up, and retain Turner and Cuthbert, as none of those named have proved equal to either. I have a few Marlboro, planted two years ago, but thus far I have nothing encouraging to say of them.

The Johnsons' Sweet is a Black Cap found some years ago on the Ozark Mountains in Arkansas, and first sent out under the name of Keys Prolific. It has been grown at Atlantic for six years; it is nearly as large as Gregg, yet black; no bloom on it, medium to late in ripening, strong, healty canes, and has never been killed during our severe winters, an *excellent* bearer. The particular merits claimed for this berry is the sweetness, and good flavor. It is the sweetest Black Cap I have yet tested; we have tried it fresh off the bushes, canned and dried, and one pound of sugar will make it about as sweet as two pounds will the same quantity of Gregg or Tyler, and then it has a flavor superior to any others I have tried. As a berry for drying it is *certainly* superior to any I am acquainted with.

When this berry becomes generally known, it can't help but be popular.

Mr. Robt. Johnson of Shortsville, N. Y., introduced it last year as Johnsons' Sweet.

I have found no blackberry, (new or old), able to stand our last four winters equal to Snyder. I have a few Ancient Britain that last winter got scorched pretty bad; that I shall try another year and if they don't stand our blizzards any better than the last two winters, I will dig them up. I hope to see what the fruit is next year. I have been watching the Lucretia Dewberry for some time, believing that in it we had a blackberry, that if it would not stand our test winters, if it would only bear bountiful crops of good fruit, it could be easily covered with hay, straw or corn stalks. I now believe that it will both stand our winters without protection and bear good crops of fine fruit. It has been grown in Guthrie county for four years, never winter killed, and last summer bore an *excellent* crop of *very large*, good berries. There is another one called the Windom, that has been grown in Cottonwood county, Minnesota, for 14 years and never winter killed, bearing the bountiful crops of anything known of blackberry kind, whether it will be a success here or not is more than I know, but I can see no reason why. I have faith enough in it to plant at least ¼ of an acre next spring.

C. F. Gardner: I would like to know how Mrs. Garfield strawberry acts with Mr. McGeehon. It stands drouth best with me. I see he puts it in his discarded list.

R. D. McGeehon: I got the plants from the originator, Mr. Crawford, fruited it five years; it scalded and sunburned. Leaves would

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sunburn and curl up, and the fruit go to nubbins. I got Cornelia of Mr. Crawford, paid a dollar a plant, but it will not stand the sun. The great trouble in strawberry growing with us is that many varieties will not stand the sun. If I can get a plant that has a good leaf it is all right. I have grown as many as sixty-five varieties in one year, and find that our dry, hot winds burn the foliage of most varieties. Out of say fifty varieties perhaps all but five will either burn or rust.

If Bubach stands the hot sun as it did last year, I have great faith in it. It and Jessie both have good foliage. They grew all summer. That is why Crescent is best, it never sunburns.

C. G. Patten: Bubach has too much foliage to amount of fruit.

R. D. McGeehon: I like Jessie better than Bubach.

C. F. Gardner: If I was to report, it would be the reverse of Mr. McGeehon; as Mrs. Garfield has excellent foliage and fruits well. It is an excellent berry.

R. D. McGeehon: A number of years ago I got the Red Jacket from the north part of the State, but it fails in foliage with me. It rusts badly. It sets full of fruit, but sunburns and scalds before fruit can mature.

John Wragg: This should be a lesson for us. Mr. Thatcher tells us of the magnificent crops of Jersey Queen, while Mr. Gardner likes Mrs. Garfield. James Vick is a success on the grounds of Judge Lewis at Winterset, and it does well other places; even beating the Crescent, having no nubbins or imperfect berries. One report is that parties could go to patch fifteen rods from the house and return to house, with six quarts of berries, all in fifteen minutes, which is pretty good for one person to do.

Jonathan Thatcher: I never saw such foliage on any other variety as Jersey Queen has. Red Jacket sun-scalds, but does reasonably well. The Jersey Queen is the sweetest and best berry we have. We have picked at the rate of 190 bushels per acre. The Crescent will do well anywhere, while the Jersey Queen is good in places. The roots are good and it is the hardiest in winter.

R. D. McGeehon: I got Jersey Queen of E. P. Roe at $3.00 per dozen, and think I got them true. I grew them four years and think the berries I got cost me 50 cents per quart. It grows too close to the ground.

If I were going to plant a patch to strawberries, with a view of getting the most berries possible, I would plant four rows of Crecent

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to two of Capt. Jack. I have had the Crescent ever since they have been in the State, and have raised good crops a quarter of a mile from any other variety; but of course they cannot be depended upon without a pollen variety being planted near them. Any good fertilizing kind will do, but the reason I would plant Capt. Jack with Crescent, is, they fertilize Crescent as good as any and produce a big crop themselves, and that is not what some other of pollen varieties will do. The varieties I have discarded, I do not condemn, except on our grounds. In other places they may do well. I do not raise the Kentucky as it does not bear with us; but it does well some places. The Sharpless is easiest killed by frost or cold rain.

Recess of ten minutes.

Called to order.

H. W. Lathrop offered the following:

Resolution—That whenever any officer or director learns of a promising winter apple, growing in his district, that has not been brought to the attention of this society, it shall be his duty to visit the locality where such apple is produced, learn its character, as a fruit, and the habits and character of the tree, and report to the society, with specimens of the apple; and that his necessary expenses in so doing be paid by this society.

On motion the resolution was adopted.

Report of A. J. Haviland, director Ninth District, was read by W. C. Haviland, as follows:

REPORT FROM DIRECTOR OF NINTH DISTRICT.

BY A. J. HAVILAND, FT. DODGE.

The condition of our orchards show but little improvement for the past few years. In the old orchards that were not entirely killed, where a sprinkling of Oldenburg, Wealthy, Tetofsky and Whitney were planted, we have had a few apples, but the old trees will never recover.

In some cases there has been an effort to refill the old orchards with two and three year old trees, which generally fails, from lack of care and culti-

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vation. We find it better to start anew with young, thrifty trees from a reliable nurseryman.

Most of the trees set last spring, as far as I have noted, were our old, tender varieties, and purchased from the itinerant tree peddler, who knows comparatively nothing about fruit and fruit trees, and their adaptability to the soil and locality in which he is selling. The orchardist in the ninth district has no worse enemy to contend with than the peddler, and still the farmers look to them (as in years past) for counsel in the selection of varieties, manner of setting, etc., for their prospective orchards. With such counsel we shall make slow progress with our young orchards.

We have several seedlings in the southern part of Webster county, owned by C. B. Andrews, that have the appearance of being as hardy as the Oldenberg. Fruit keeps until January, quality and size of one of them compares favorably with the Utter's Red, and looks very much like it. Tree No. one stands twenty-nine feet high, with a girth ten inches from the ground of five feet two and one-half inches. with a top spreading thirty-six and one-half feet. No. two, girth two feet from the ground, five feet three and three-fourth inches, spread of top thirty feet, height twenty-seven feet.

The nursery stock of Bardwell & Haviland is looking remarkably well especially the Russian and the Gideon stock; the latter which they control, as I understand it, except the Wealthy and a few of the crabs.

Small fruits were a failure over most of the district except where good cultivation or mulch helped to retain the little water left by the melting snow, which was all we had until August 10th.

There were but few cherries and the birds picked them as fast as they commenced ripening. The Richmond proved hardier with me than the Wragg.

Plums were a failure except in favored localities the DeSoto is the best variety we have.

Grapes a medium crop; Concord, Worden and Moore's Early the leading varieties.

Currents and gooseberries failed as a rule over the district.

Blackberries bloomed and set a good crop, but soon dried on the bushes.

The dwarf Juneberry is hardy and a good bearer. No difficulty in picking the berries, the birds will attend to that as soon as the berries begin to turn.

Shading fruit trees with evergreens, as suggested in our report of 1882 has proved the theory that a good shade, summer and winter, will do much towards growing a good tree free from sun scald and borers.

The Red Cedar and Arbor Vitæ are good varieties to set; kept pruned to four feet high and two feet wide will protect a tree in good shape without any rubbing or chafing as with board and lath screen, and always in place.

The statement widely circulated that the fungus which grows on the Red Cedar would produce blight on our fruit trees is a mistake, and should be corrected by the Horticultural Society.

The cedar is one of our best trees for wind-breaks and shelter belts.

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Evergreens have made a good growth and will do well on all dry tilable land in the district.

J. C. Plumb: I rise for information. I wish to know if the fungus on red cedar is same as rust on our apple trees.

John Craig: Dr. Halstead, of the Iowa Agricultural College, tested this, but was not able to cultivate this rust on cultivated apples, but could on Wild crab and Juneberry. As there is more than one kind of rust on red cedar, it is not conclusive; but it shows that we have not as much to fear from red cedar rust as some suppose.

J. C. Plumb: I am glad to hear this testimony. I have known of apple trees growing around red cedars and no damage result.

H. W. Lathrop: From discussion at the Illinois Horticultural meeting and other evidence, I am quite certain that red cedar rust has been known to affect the cultivated apple.

Charles Patterson: Some have succeeded in producing the red cedar rust on the apple.

John Craig: There are about seven different species of fungus on the cedar. The experiment of Dr. Halstead only proved, that the species we had, did not reproduce on the cultivated apple.

John Wragg: I wrote Prof. Bessey at one time on this subject. He sent proof sheet of an article on this subject. He took the ground that we had no reason to apprehend trouble from this source.

The secretary read his report as follows:

REPORT OF SECRETARY.

The great drought of 1887, following the heretofore unprecedented drouth of 1886, gives us an experience that we hope to escape in the future.

In many parts of the State, no rain sufficient to thouroughly wet the subsoil has fallen since May, 1886

Northern Iowa has fared better, and local showers have relieved small localities over other portions of the State. These two seasons of drouth with four consecutive test winters, have wiped out whole orchards in the most unfavorable portions of the State, and even in the most favored localities many varieties have secumed to the unfavorable effects of cold, heat and drouth.

Notwithstanding the severe tests, some orchards, and varieties scattered over the State remain, and especially in south-west Iowa, many orchards are

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in fair condition and bore a fair crop of fruit, especially apples, the last summer.

In perhaps three fourths of the counties of the State, less than a home supply was raised, and in whole counties north and east almost no winter apples were grown.

CORRESPONDENCE.

During the past year I have had a very large correspondence on horticulture, and I might say other topics.

Parties interested in patents of various kinds; tariff, reformers, etc., too numerous to mention, have written me, all anxious to have their claims considered. Courtesy demands a reply to many of these letters, but I do not bring them here for action, as I believe we have more important work before us, and that we have no time to discuss tariff, free trade or the dozens of other things parties seek to introduce to our attention.

COMPLAINTS.

A great many complaints reached me as to delay in sending out reports of last meeting. As I was not the publisher of the report, I could not explain fully the cause of delay, but had to answer the inquiries as best I could.

REPORTS SENT OUT.

After reports were sent out by past secretary, I learned that quite a number failed to get them, and in all such cases I mailed them each another copy.

REPORTS.

The increase in number and work of the district and local societies, is so great that some means must be restored to condense reports of their meetings, if it is desired to keep our annual valume within the present prescribed limits.

I hope the society will act in the matter and give instructions.

CONSTITUTION.

A close reading will disclose some peculiarities. It allows but ten directors, we have twelve. (See Art. 3)

By Art. 7, the members present of the Board constitute a quorum for the transaction of business at any regularly called or adjourned meeting.

The board may make or change By-laws, etc

Now, supposing at any time, a called meeting even, there are two or three members present they can change the By-laws.

But suppose the Society itself desires to change the By-laws, it takes a two-third vote to do it. To illustrate, suppose at an annual meeting seventy-five members are present. It would require an affirmative vote of fifty to

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change a By-law. Thus it is seen that forty-nine members at a regular meeting could not do what two members of the board could do.

It looks to me as though a part of this delegate power should be revoked, or else that the Society should recover same control of the By-laws that it now has over the Constitution. A bare majority can change Constitution, but it takes a two-third majority to change By-laws.

The Society has outgrown Article 3, of By-laws, and it should be repealed.

EXPERIMENTAL WORK.

No record of experimental work having come into my hands, I have no report to make, but suggest that some plans should be adopted of getting essentials of the work in our report, or before the public.

A ledger account should be kept with station, and a condensed report made annually; all to be carefully preserved for future use.

ARBOR DAY.

There is a growing demand for a day to be set apart for tree-planting.

Some of us tried last spring to arrange for a particular day, but failed to agree, or rather we began too late.

I suggest that we fix third Tuesday in April as Arbor Day. I believe that the fixing of a particular day will stimulate many of our citizens to greater zeal in adorning and beautifying their homes.

Our teachers and the pupils in our schools should be urged to adorn the school grounds, and our horticulturists should not be behind in setting good examples.

STATE FAIR.

I believe the best of feeling exists between the State Agricultural and State Horticultural Societies, and we should do all in our power to make a good fruit display at our State Fair.

CONTINGENT FUND.

The order of this Society, for the Secretary to furnish postpaid reports to members of all disirict and local horticulture societies in the State, largely increases the expense of the office.

By reference to reports of past years, it will be seen that the expense of the office have exceeded the receipts from membership fees.

The expense now will be much greater because of the sending of reports to local societies, and the income will probably be much less, as, owing to changes of Secretary, most of the fees now go direct to the Treasurer.

In view of these facts, I think a contingent fund should be placed in the hands of the Secretary, to be accounted for in vouchers to be passed upon by the Board as other accounts.

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AID TO DISTRICT SOCIETIES.

The $50 granted to each of our district societies has strengthened them very materially.

I believe the appropriation should be made $100 per year for each of them, and reports sent postpaid by this Society.

These Societies are doing a good work in their respective localities, and are a necessity, and will become still more so if this Society becomes located at Des Moines, as now seems probable.

HORTICULTURAL ROOMS.

Our rooms should be furnished. It will take but little to finish them, or more properly, to complete the furnishing.

It is probably only a question of a short time until your Secretary should keep open office in the Capitol.

There seems to be considerable demand now for such an arrangement, but the Society may not see its way clear to do so at present.

PROPERTY IN SECRETARY'S HANDS.

As no property of any kind, not even bond of Treasurer, came into my hands as Secretary, I have nothing to account for in that direction.

At last meeting I was authorized to gather from library files of reports for use of Secretary. As yet have not secured them but hope to soon.

FINANCIAL STATEMENT.

Postage stamps	$18.05
Stationery, wrapping paper and twine	2.55
Postal cards	1.00
Express, Reports sent Indiana Horticultural Society	.95
Express, Missouri Horticultural Reports	1.15
Printing, cards and slips	1.25
Exchange, Williams check	.25
Railroad certificates	.85
2,000 Programs	10.50
500 Envelopes	1.75
Letter Heads and Envelopes	6.75
Postal Cards	5.00
Expenses Summer Meeting	6.45
Total	$56.50
Received Membership Fees	5.00

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Life membership as follows:

H. P. Williams, Larchwood	$ 5.00
R. G. Moon, Bedford	5.00
Davi dAtkin, Amber	5.00
Of H. Strohm, on Order	11.75
Total Receipts	$31.75
Due Secretary	24.75

GEO. VAN HOUTEN, *Secretary.*

On motion the Secretary's report was referred to a committee to be appointed by the President.

Committee on Secretary's Report—R. P. Speer, H. W. Lathrop, and C. F. Gardner.

Treasurer reported as follows:

Iowa State Horticultural Society in account with H. STROHM, *Treasurer.*

1887.			
January 18.	By cash balance on hand	$	4,967.67
January 18.	Annual membership at winter meeting held at Charles City		88.00
January 18.	Life membership		15.00
	Annual membership received during the year, (8 members		8.00
	Life membership (1)		5.00
June 15..	By State appropriation for the year ending June 30, 1887		2,500.00
Nov. 22.	By J. L. Budd, membership fees		89.25
1888.			
January 15.	By interest		178.48
	Total	$	7,751.35
	Amount paid out		1,972.58
	Balance due Society	$	5,778.77

Three hundred and ten dollars of this amount belongs to the Life Membership Fund, and cannot be used for current expenses.

AMOUNTS PAID OUT.

1887.			
January 21.	To premiums paid on apples	$	50.00
	To premiums paid on seedling apples		10.00
	To E. Secor, expenses attending winter meeting as Director		11.10
	To M. Vincent, expenses as Director		17.15
	To Wm. C. Haviland, expenses as Director		20.45

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1887.			
January	21.	To E. M. Reeves, expenses as Director	$ 5.77
		To A. F. Collman, expenses as Director.....	19.76
		To R. P. Speer, expenses as Director.....	10.65
		To C. L. Watrous, expenses as Director.....	22.64
		To C. P. Osborn, expenses as Director	7.15
		To H. W. Lathrop, expenses as Director.....	16.42
		To H. W. Lathrop, expenses as delegate to Illinois Horticultural Society	20.85
		To John Wragg, expenses winter meeting..	19.75
		To E. M. Reeves, expenses summer meeting.....	17.20
		To Silas Wilson, incidental expenses distributing committee and President.....	12.00
		To G. B. Brackett, office expenses, Secretary.....	64.00
		To A. J. Haviland, extra expenses, winter meeting, 1886	2.00
		To M. Vincent, extra expenses, winter meeting, 1886	5.00
		To H. Strohm, salary, Treasurer.....	50.00
		To J. L. Budd, attending distributing committee..	18.32
		To G. B. Brackett, attending distributing committee	15.60
		To J. L. Budd, incidental expenses, committee ...	10.94
		To J. L. Budd, incidental expenses, past Secretary	29.60
		To Silas Wilson, expenses attending winter meeting	26.15
		To John Wragg, expenses summer meeting.....	7.22
		To Wm Grange, janitor fees, winter meeting.....	8.00
Feb.	27.	To John Wragg, expenses attending Wisconsin Horticultural Society as delegate.....	35.69
March	10.	To Ida Southwell, reporting and expenses at annual meeting, January 18 to 21.....	37.37
		To G. B. Brackett, salary, secretary.....	350.00
		To G. B. Brackett, expenses winter meeting.....	21.35
April	5.	To R. P. Spear, expenses as member of distributing committee.....	12.54
	20.	To G. B. Brackett, for cash paid E. Marting, for wood specimens for State Horticultural Society	84.50
		To G. B. Brackett, expenses meeting distributing committee.....	15.30
June	15.	To L. Harbach, book case.....	500.00
		To Silas Wilson, stock furnished experimental stations and committee work distributing it.....	85.78
		To Geo. Van Houten, printing and stationery.....	11.75
October	18.	To G. B. Brackett, expenses in printing reports, postage, express, etc.....	101.58
		To G. B. Brackett, expenses fitting up museum....	55.35
		To Geo. Van Houten, salary as secretary of Western Iowa Horticultural Society for the year 1887..	50.00

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1887.		
October 18.	To C. W. Burton, salary as secretary of Eastern Iowa Horticultural Society for the year 1887... ..$	50.00
21.	To John C. Ferris, salary as secretary of Northern Iowa Horticultural Society for the year 1887.....	50.00
24.	To R. P. Speer, committee work on arboretum.....	10.65
	Total.....$	1,972.58

SUPPLEMENT TO TREASURER'S REPORT.

Iowa State Horticultural Society in account with H. STROHM, *Treasurer.*

1888.		
January 20.	By cash on hand .....$	5,778.77
	Annual membership at winter meeting held at Des Moines.....	40.00
	Life membership.....	20.00
	Total.....$	5,838.77
	Amount paid out.....	1,119.63
	Balance on hand.....$	4,719.14

Three hundred and fifty dollars of this amount belongs to the life membership fund and cannot be used in payment of current expenses.

AMOUNTS PAID OUT AT JANUARY MEETING.

1888.		
January 20.	To premiums paid on apples.....$	63.00
	To premiums on seedling apples.....	15.00
	To N. K. Fluke, expenses attending winter meeting as director.....	12.62
	To J. M. Elden, expenses as director.....	16.00
	To C. L. Watrous, expenses as director.....	6.25
	To C. F. Gardner, expenses as director, summer and winter meeting.....	28.90
	To A. F. Collman, expenses as director..... ...	13.40
	To R. P. Speer, expenses winter meeting..... ...	10.50
	To H. W. Lathrop, expenses winter meeting.....	10.35
	To Jonathan Thatcher, expenses summer and winter meetings and premium on apples.....	17.67
	To Eugene Secor, expenses summer and winter meetings.....	18.25
	To C. G. Patten, expenses summer and winter meetings.....	29.90
	To H. Strohm, expenses winter meeting.....	10.35
	To N. K. Fluke, expenses summer meeting.....	4.85
	To G. B. Brackett, expenses as delegate to American Pomological meeting.....	73.62

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1887.

January 20.	To F. W. Taylor, expenses delegate to Missouri Horticultural Society and winter meeting	$ 83.80
	To Iowa Agricultural College for stock furnished for experimental stations, 1887	270.58
	To C. L. Watrous, stock furnished experimental stations, 1887	94.99
	To George Van Houten, balance office expenses, 1887	24.75
	To George Van Houten, incidental expenses, 1888	75.00
	To George Van Houten, on salary, secretary	200.00
	To George Van Houten, expenses winter meeting	10.80
	To H. W. Lathrop, expenses attending Agricultural and Industrial Institute at Des Moines	11.65
	To Perkins & Gatch, use of plates at winter meeting	1.60
	To hotel expenses for delegates from Wisconsin and Missouri	7.90
	To H. Strohm, salary as treasurer	50.00
	To Silas Wilson, expenses attending Arboretum committee	8.40

Report received and referred to committee on Secretary's report.

A paper on Propagation of Ornamental Shrubs, by George W. Sturtz, read as follows:

PROPAGATION OF ORNAMENTAL SHRUBS.

BY GEO. W. STURTZ.

This paper is part of a thesis written on the propagation of ligneus plants. Being an amateur propagator, I have taken the opinion of the best authorities.

ORDER URTICACEÆ.

MORUS—MULBERRY.

Morus Tartarica—Cut-leaved mulberry; may be propagated from calloused cuttings, or budded on the common forms.

ORDER OLEACEÆ.

SYRINGA—LILAC.

Usually grown from stolons; may be grafted on the ash.

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LIGUSTRUM—PRIVET.

Grown from seed treated same as the cherry; may be grafted on the ash or lilac.

CHIONANTHUS—WHITE FRINGE.

Chinanthus Spec—Easily propagated from seed; can be budded on the green ash.

FORSYTHIA.

Forsythia Spec.—Propagated from seed or cuttings.

ORDER BETULACEZÆ.

BETULA—THE BIRCHES.

Grown from seed kept dry until spring, then sowed in drills and covered very lightly; when the plants get above ground they should be shaded, and dry sand spread around them to prevent damping off; also grown from cuttings in the fall, and set in a box with about an inch of moss in the bottom, and on this two inches of sand. Bore holes in the box for drainage; stick the cuttings in the sand and water them every three or four days; keep where they will not freeze, but not be too warm or have too much light. Plant out in June or July, where they may be slightly shaded; they may also be budded or grafted on the common varieties.

ALNUS—THE ALDERS.

Some varieties are very ornamental, as Alnus Incana Laciniata, propagated same as the birches.

ORDER SAXIFRAGACEÆ.

PHILADELPHUS—SYRINGA MOCK ORANGA.

Propagated from cuttings put out in the fall.

DEUTZIA.

A very brilliant shrub, but must be covered during the winter; propagated same as the Philadelphus.

RIBES—CURRANT.

Ribes Spec.—All of them are propagated from cuttings of the new wood put out late in the fall. If desired to grow in the tree form rub off the buds at the base of the cuttings so they will not throw up suckers.

HYDRANGEÆ.

Hydrangeæ Spec—Very ornamental shrubs. Propagated from cuttings of the new wood put under glass in the fall and potted during the winter.

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ORDER ROSACEAE.

ROSA—THE ROSE.

Rosa Rugosa—One of our most beautiful Hardy Rose; most frequently propagated from Stolons, but may be propagated from cuttings put to root any time from September to January, or by budding in spring and summer.

POTENTILLA—FIVE-FINGER.

Potentilla Spec.—Small flowering shrubs; propagated by divison of the root or stolons; difficult to propagate from cuttings.

RUBUS—BRAMBLE OR RASPBERRY.

Rubus Odoratus—Flowering raspberry; a hardy shrub; propagated from root cuttings or suckers.

SPIRAEA.

This genus contains a number of beautiful flowering shrubs.

Spiraea Fraxinifolia—And all those that sprout may be propagated from root-cuttings or sprouts.

Spiraea Salicifolia—And all of this habit of growth are propagated from stolons.

Spiraea Opulifolia—And all those that do not sucker or throw up sprouts are propagated by cuttings put out in the fall.

COTONEASTER.

Cotoneaster Spec.—Propagated same as the apple and may be inter-grafted with it.

ORDER LEGUMINOSAE.

CARAGANA.

Caragana Spec.—A number of small trees; quite ornamental.

Keep the seed dry until time for planting, then soak for a short time in scalding water.

CYTISUS.

Cytisus Spec.—Flowering shrubs; grown from seeds or may be grown from stolons.

WISTARIA.

Wistaria Spec.—A climber; grown from seed and by layering.

AMORPHA.

Amorpha Spec.—False indigo; a hardy native shrub; propagated from seed mixed with sand and allowed to freeze in winter.

CLADRASTRIS.

Cladrastris Tinctoria—Yellow wood; a small ornamental tree; propagated same as the Caragana, except that it will not stand as much scalding.

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ORDER CAPRIFOLIACAE.

LONICERIA—HONEYSUCKLE.

Loniceria Spec.—Beautiful flowering shrubs; the climbers are propagated by layering; the tree form from cuttings.

DIERVILLA—WEIGELIA.

Diervilla Spec.—Grown from cuttings of the new wood with a little of the old wood at the base.

VIBURNUM—SNOWBALL.

Viburnum Spec.—A group of beautiful flowering shrubs; propagated by layering or from seeds.

SYMPHORICARPUS—SNOWBERRY.

Symphoriearpus Spec.—Small flowering shrubs; grown from seed mixed with sand, and allowed to freeze, or from stolons.

SAMBUCAS—ELDER.

Besides our common elderberry are several cut-leaved and very ornamental varieties; grown from cuttings put out in the fall, also from seed.

ORDER CORNACEAE.

CORNUS—DOGWOOD.

Cornus Spec.—Propagated from cuttings of the new wood put out in the fall.

ORDER BIGNONIACEAE.

CATALPA.

Catalpa Spec.—A fine ornamental and timber tree; propagated from seed gathered about the 1st of October, and kept dry during the winter; soak for about two hours and mix with sand before sowing; take up the plants in the fall and heal them in or pack away in the cellar.

ORDER ARALIACEAE.

PANAX.

Panax Sessiflorum—A flowering shrub; propagated from root cuttings.

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ORDER ELAEGNACEAE.

ELEAGNUS.

Eleagnus Spec—Some of the species in this genus are very ornamental. Grown from seed soaked for about twelve hours, mided with sand and allowed to freeze. Also grown from cuttings put out in the fall same as currant and mulched, or cuttings can be kept in sand and put in the propagating pit in the spring.

ORDER ANCARDIACÆA.

RHUS.—SUMAC.

Rhus spec—Some of the imported species are very ornamental. Grown from suckers, or cuttings put out in the fall.

ORDER BERBERIDACEÆ.

BERBERIS—BARBERRY.

Barberis spec—Some species are quite ornamental. Grown from seed, stolons, or cuttings of the new wood. The berry should be washed off, the seed mixed with sand and allowed to freeze, but not absorb too much moisture. Plant sand and all in nursery. Cut the stolons in short pieces, keep in sand and plant in spring same as corn.

MAHONIA.

Mahonia spec—Imported dwarf shrubs. Propagated same as Barberry.

ORDER HYPERIACEÆ.

HYPERICUM—ST. JOHNS WORT.

Hypericum kalmianum—A dwarf shrub. Propagated readily from cuttings with bottom heat.

ORDER RHAMUACEÆ.

RHAMNUS.

Rhamnus spec—Grown from seed in sand over winter, or kept dry. Ornamental forms may be budded on the common seedlings.

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ORDER CELASTRACEÆ.

CELASTRIS.

Celastris scandens—Climbing bitter-sweet. A very desirable climber. Grown from seed mixed with sand and allowed to freeze.

EUONYMUS—STRAWBERRY TREE.

Euonymus spec—Propagated from seed kept dry until spring. Soak before sowing.

ORDER TAMARISCINEÆ.

TAMARAX.

Tamarax Africana—A very beautiful shrub. Propagated from cuttings put out in the fall, or in the green house by bottom heat.

GEO. W. STURTZ,
Boone, Iowa.

Boone county.

DISCUSSION.

C. L. Watrous: This is a paper of value, and requires but little discussion, as it carries its own weight with it, and no doubt will be read with interest when published in our report.

J. C. Plumb: It touches upon a field that is a growing field. We cannot count, in dollars and cents, the value of ornamentals about the home. We have just begun to appreciate them in the west. When we go east we see them highly appreciated. It is a paper I shall value and be glad to have in my library.

Committee on treasurer's report reported as follows:

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REPORT OF COMMITTEE ON THE TREASURER'S REPORT.

DES MOINES, IOWA, January 18, 1888.

MR. PRESIDENT:

We, the committee, appointed to examine the reports of H. Strohm, the Treasurer, respectfully submit that we find his report for 1887 correct in every respect, and that he has exhibited vouchers for all money paid out.

R. P. SPEER,
H. W. LATHROP,
CHARLES F. GARDNER,
Committee.

On motion report of committee was adopted.

On motion the Treasurer was authorized to loan the Life Membership Fund, on farm mortgage, not in excess of 40 per cent of estimated value of land, accepted as security.

EVENING SESSION, SECOND DAY.

Met pursuant to adjournment.

On motion of C. L. Watrous, Mrs. Phoebe Thompson of Grundy Center, was made an Honorary life member of the Society.

On motion of H. W. Lathrop, Prof. J. L. Budd was elected as a delegate to American Pomological Society, to be held in California, this winter.

The Secretary was ordered to forward credentials by mail, and to send notice by telegraph.

Committee on Secretary's Report reported as follows:

DES MOINES, IOWA, January 18, 1888.

MR. PRESIDENT:

The committee appointed to examine the report of Geo. Van Houton, Secretary of this Society, respectfully submit the following report:

We recommend that the amount of seventy-five dollars, or as much thereof as may be necessary, be placed in the hands of the secretary as a contingent fund, to pay the actual expenses incurred in the discharge of the duties of his office.

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We find the financial account correct and recommend that the amount due him, $24.75, be paid.

The Committee on Experimental Stations should be required to report to the Secretary of the Society the number of kinds of trees or plants, furnished each station and the cost thereof. Such reports to be made in time to be inserted in the Annual Reports of this Society. All of which is respectfully submitted.

CHARLES F. GARDNER,
B. P. SPEER,
H. W. LATHROP,
Committee.

On motion, the report adopted.

Committee in President's address reported as follows:

Your committee to whom was referred the annual report of the President, respectfully report as follows, that we concur in the following suggestions:

First. That the Society allow $100 to each of the District Societies.

Second. That $150 be paid on the draft of the Secretary of the Association of Industrial Education and Farmer's Institutes.

Third. That a committee of three, of which the president shall be one, shall examine and report amendments to our constitution and by-laws. The report to be made at next annual meeting.

Fourth. That the constitution and by-laws of the Society, the organic act under which the Society exists, together with the law, relating to Horticulture and Forestry, be printed annually in the published transactions. Also the following by your committee:

Fifth. That a Custodian be elected to have charge of the rooms and property of Society in the Capitol building, including the Library, and that his compensation be fixed by the Board of Directors.

C. L. WATROUS.
H. W. LATHROP.
JOHN WRAGG.
Committee.

On motion the report was adopted, and the committee discharged.

Election to officers declared to be in order. C. W. Burton and F. W. Taylor, acting as tellers.

The election resulted as follows:

C. G. Patten, President, Charles City.

Eugene Secor, Vice President, Forest City.

Geo. Van Houten, Secretary, Lenox.

H. Strohm, Treasurer, Iowa City.

G. B. Brackett, Custodian and Librarian, Denmark.

F. H. Bruning, Director, Second District, Kent.

N. K. Fluke, Director, Fourth District, Davenport.

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C. L. Watrous, Director, Sixth District, Des Moines.

R. P. Speer, Director, Eight District, Cedar Falls.

J. M. Elder, Director, Twelfth District, Concord.

Motion that the selection of Director of Tenth District, be referred to Executive Committee.

Carried.

C. A. Mosier read a paper, Our Friends and our Enemies, The Birds.

OUR FRIENDS, THE BIRDS.

BY C. A. MOSIER, DES MOINES.

To those who dwell lovingly upon the works of nature the story of the bird creation is an interesting and pleasing one. There is no member of this society, present, who can recall a time in the distant flight of years, even to the earliest childhood, when he did not hail with joy the return of the birds in the springtime, and watch for them as eagerly as he gathered the first violets amid the dry leaves on the hillside. And through all the seasons when the birds were here, even to the present time, he has often stopped to watch their flight, or witness the building of their nests or feeding of their young. He has listened with rapturous delight to their notes at morn and noon and eve, and now and then has heard their sweet strains in the stilly night and to-day there is scarce a bird that visits our state, however temporarily, but that he recognizes it by its notes or by its manner of flying.

The duck and the grouse are as easily distinguished one from the other by their movements when on the wing as they are by their notes of quack, quack, quack, and m-boog-em-boo, kea-kuk-kuk-kuk.

The woodpeckers have a motion when flying which at once distinguishes them from all other birds, though the goldfinch has a somewhat similar style of flight. Different species of the same family of birds are thus distinguishable. The close observer knows the downy woodpecker from his golden winged cousin when in the air by his manner of flight, and in like manner he recognizes the different members of the turdidae or thrush family as far as he can see them.

The wing movement of birds, like the walk of individual men, is indicative of character. How majestic, how expressive of power is the flight of the eagle. How weak and awkward the bittern. How vascillating and uncertain the flight of the black cormorant. How swift, sure and graceful the humming bird.

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The meadow lark, how innocent and sweet the joy its flight discloses. How proudly and defiantly float the trumpeter crane and the sand-hill in the blue depths of ether above the cumuli that fleck and whiten the heavens? The mysterious power of flight has always been full of wonder and of interest to me, and for more than forty years I have studied the motions of birds upon the wing whenever opportunity was presented. It is a matter, too, that has occupied the attention of scientific men, "the latchet of whose shoes I am unworthy to stoop down and unloose." One of these, Sir Isaac Lancaster, went to Tampa bay and resided there for five years engaged in the study of soaring birds, those that sustain themselves for an indefinite time without any motion of the wings, such as buzzards, frigate birds, cranes, eagles, gulls, etc. In a talk before the American Association for the Advancement of Science he said, "that on one occasion he watched a score of buzzards for fourteen consecutive hours during which time not a dozen flaps were made for each bird."

He then related his experiments with mechanical contrivances by which he was able to imitate and to solve, in part, the mysteries of motionless flight. But the ingenuity of man will never enable him to construct so so wonderful a flying machine as a bird.

Every feather of a bird is supplied with muscles that come clear out of the body, through the skin and attach to the feathers in the sheath that surrounds the quill end of the feather, and are so attached as to move the feathers in various directions at will, instantaneously. It has been estimated that some birds have more than 12,000 of these little feather muscles. Is it to be wondered at then, that the ingenuity of the Yankee has not enabled him to construct a machine that would navigate the upper air with the celerity and precision of even that most awkward bird when on the wing, the bittern.

Feathers are the positive and distinguishing feature of birds. Other animals devoid of this characteristic, imitate in a remote degree the power of flight possessed by birds. The flying-squirrel with its parachute-like membrane, extended by means of its legs, can glide safely from tree to tree. I have seen lizards dart from one tree to another by means of a fringe-like membrane extended on the sides by false ribs. There is said to be a species of tree frog which can support itself in a similar manner. But the flying fishes found in the warmer seas seem to me to imitate more nearly the wing motion of birds than any of the animals I have mentioned. These fishes use their long pectoral fins in a quivering, fluttering manner to assist them in their flight after leaping into the air, and after traveling several hundred yards touch the water and immediately rise, and this flight is repeated again and again until they seem to cease their efforts from sheer exhaustion and sink out of sight in their native element, the deep sea.

The birds of remote geological ages were not so beautifully clothed with feathers nor so finely strung with vocal chords as are our birds that are now spending their winter in the sunny south eating grapes from the wild vines or picking at the pericarp of semi-tropical plants and shrubs.

A Baltimore oriole and an alligator, an eagle and a lizard, suspended from

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the same genealogical tree, would present rather a ludicrous combination, and like some other bipeds the birds might wish to disclaim the relationship, but the cold rocks have proclaimed the family secret to a heartless world.

It was by the accidental finding of a fossil feather in the lithographic slates of Bavaria about thirty years ago that the true relation of birds to other animals was discovered. Before that time the break between birds and the rest of creation was so abrupt, so wide and so deep that even the most advanced workers in the field of comparative anatomy hardly dare hope that it would ever be bridged over, as it had been by recent discoveries, bringing birds closer to their progenitors than any other two classes of the animal creation. More than a century ago eminent naturalists expressed doubts on the subject, but the man who proclaimed boldly views antagonistic to the then generally accepted views of a separate creation of each class of animals was not only denounced as an infidel, but was in danger of the stake.

Though we live in an age of the greatest civil and religious liberty the world has yet known, though a flood of light is pouring in upon us and the hidden mysteries of the book of Nature, as seal after seal is broken, are being made so plain that even a little child can understand them, yet the pages of the great volume containing the most entertaining and most interesting and useful illustrations are yet uncut.

Following the finding of the single feather of which I have spoken, came the discovery of parts of an animal to which it was supposed the feather belonged; later still, two perfect specimens of the bird, Archæopteryx, were found in the same region, proving not only the existence of birds in the Jurrassic period, but pointing to the reptilian origin of the class Aves in a manner not to be questioned. These specimens are all deposited in the British Museum. Archæopteryx was a land bird about the size of the crow.

Subsequently, our countryman, Professor Marsh, of Yale, found in the Jurassic beds of Wyoming, a fossil bird similar to Archæopteryx, which he denominated *Laopteryx*. These two probably lived contemporaneously, though on different continents, and are the oldest known bird forms.

Prof. Marsh has since discovered many fossil birds in the cretaceous formation in the Smoky Hill region, mostly in Western Kansas, all of which he deposited in the museum of Yale College.

These specimens represent two very different types of birds which lived together, or in the same vicinity in Mesozoic time. One was a class of large swimming or wading birds, with only rudimentary wings, as the penguin of to-day; the other small, swift flying birds, having large wings. His discoveries of fossil birds have proven conclusively that all the ancient birds had teeth either set in grooves or in sockets, sometimes recurved but always sharp and covered with hard enamel, and so reptilian in character as to unmistakably indicate their saurian origin.

The great physical and climatic changes which our globe has undergone, together with other natural causes, have modified these ancient bird-forms so much that one can hardly believe that the beautiful, brilliant plumaged birds we see in our summer walks are the direct and lineal descendants of

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those "ungainly, gaunt and ominous birds of yore," yet no fact seems better established.

Of living birds there are none with teeth, yet the biting instinct remains with many families, and some have the ability to inflict serious wounds, such as the parrots and birds of prey.

About twenty years ago I shot and wounded in the wing a large yellow pelican in Storm Lake. A trapper with whom I was camping, came with his narrow, canoe-like boat and took me with him to chase, and if possible capture my prize. After a long race we came alongside the fleet swimmer. I stretched out my hand to take him by the neck when the bird seized me by the arm as furiously and seemingly with as much assurance of power to do me harm, as would an alligator in the swamps of Florida. But he was powerless to inflict serious injury. Nature, by her mysterious processes, had long since taken from all birds the weapons which enabled Ichthyornis and Hesperornis and other ancient birds to hold their own amid the teeming saurian marshes and inland seas of both continents in the Mesozoic age. The seizing of my arm by this large yet harmless waterfowl has always seemed to me an instinctive act inherited from his sharp-toothed prehistoric progenitors.

The number of species of birds in existence to-day is estimated at from 6,000 to nearly double that number. Of these but a few hundred breed in this State. The advance of civilization and the destruction of the natural coverts for our birds has within the last forty years steadily diminished the number that make this their summer home. We may have patches here and there where birds find a safe retreat from marauders of the human species, and other natural enemies of the feathered tribe, but in and about the cities and towns nigger-shooters and cheap shotguns in the hands of idle men and boys yearly deal death to a large per cent. of our home birds. Water-fowl that visit our waters semi-annually during their migration periods are slaughtered for home and foreign markets, and always for the so-called pleasure of killing them, till their decimated ranks are but a sorry showing of what was once to be seen on the bosom of our lakes and streams.

We have a law upon our statute books which was intended to protect our song birds, but that law like the birds, is left in the hands of its enemies who know no law but their own calloused nature. And it seems to me that this society has, by the very wording of the subject assigned me, placed itself in a position to encourage the law. Birds, "Our friends and our enemies!" And this is in substance the stereotyped form of presenting this question not only by this Society, but by all kindred societies of the other States of the Union. The birds our enemies! The man who entertains such a sentiment in his heart is the fit companion for the dynamiters! At least he is the counterpart of Longfellow's "Parson," who,

> "While walking down the rural lane,
> Lapped the wayside lilies with his cane."

Have no fears that the birds which now visits our orchards and groves and hedges will not be killed fast enough. The butchery will progress in defi-

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ance of the law with our assistance. I know an instance where recently, upon the premises of an officer of the courts of this city, and by his invitation and consent, a friend (not of the birds) killed more than twenty songsters, mostly cat-birds, in a single afternoon. Of this number one was a bird that with his mate had built a nest and reared young near the path where I was daily accustomed to pass, year after year, and I am quite certain that that bird knew me as well as any domestic animal I ever had. I have spent many an hour altogether teaching him, for he would imitate whatever sound I would utter and try to whistle tunes I repeatedly whistled to him, always waiting till I was silent before he attempted to rehearse what I had given him for a lesson. Morning and evening he seemed to be there awaiting my appearance and was so tame, so friendly, that I could almost take him in my hand, which he never quite consented to.

When we reflect upon man's conduct toward the lower animals in all climes and in all ages, we cannot but exclaim: What a monster is man! He terrorizes the whole earth! Even the king of beasts flees before him and attacks him only when he pursues and challenges to mortal combat. The entire animal kingdom shrinks from him from the very protoplasm in the depths of the ocean to the gigantic elephant in the jungles of Africa. Man is the most ferocious beast that stalks the earth! His ravenous appetite for blood is always whetted and seldom or never satiated. Every living creature upon the globe he regards his lawful prey.

It would seem that man is never to stay his hand of destruction till the world is a void—

> "Seasonless, herbless, treeless, birdless, lifeless—
> A lump of death—a chaos of hard clay."

To whatever quarter of the word we turn there we see man pursuing bird and beast to extinction, either wantonly for the savage glory of killing or for gold. He kills the elephant for his tusks, and this he has done till but a vestige of his race remains.

He has chased the whale, that enormous animal of the deep, from pool to pool, until he has no more profit from hunting his decimated ranks; the buffalo which but lately ranged the countless numbers on the desert plains of the West, he has killed wantonly and cruelly till the remnant of his kind, some eighty individuals, are all that are left to tell the world that such an animal ever lived, and these survive only because guarded by soldiers in the National Park. On the high seas the seal has been slaughtered, young and old, till extinction is nearly reached. He has preyed indiscriminately upon the food fishes of the waters of our rivers and bays from shore to shore, from continent to continent, and has so nearly totally destroyed them that what nature so bountifully supplied—and in this attempt to remedy and error he has so far signally failed.

On the plains of New Zealand the largest bird known to man, the gigantic moa, so tall a bird that man could walk erect under his breast bone and between his legs, a bird more than ten feet in height, has within the last century been exterminated by the New Zealander, and all that civilized man

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will ever know of the bird is what he can glean from a few partially complete skeletons of these wonderful birds and the tradition of the inhabitants of that far off islands.

The Irish elk long ago was blotted from nature's book of living animals; the American elk, formerly plentiful on the prairies of all the Western States, exists now only in the high montains of the far West, whither he has taken refuge, and awaits the fate of his Irish relative, which much soon inevitably overtake him. The antelope will be no more in another decade.

The moose once plentiful in the United States, is found only in the remote fastnesses of the forest of British America.

The same may be said of the caribon. Within the Arctic circle a few specimens of the musk-ox, once plentiful, may be obtained, but scarce enough to satisfy the demands of scientific research. The most useful fur bearing animals are all hunted and trapped to the verge of utter extinction by men armed with modern improvements in death dealing apparatus and contrivances.

On the shores of Northern Europe, man sallies forth with baskets and robs the eider duck not only of her eggs but of the down she has plucked from her breast to keep her young from suffering till nature shall clothe them for their life at sea. And this practice is carried on to such extent that the eider duck will soon cease to exist.

On our own Northeastern shores, within the last fifty years, the fishermen were in the habit of knocking over to use for bait the one or two young found in the nest of the great auk. The great auk is no more; it is a bird of the past and but few specimens are preserved; no one dreamed its extinction was so near at hand.

For the last twenty years man seems to have turned his fury loose upon the air. The rapid increase and cheapness of breech-loading firearms have enabled him to almost annihilate the wild turkey, the grouse, the quail and nearly all the larger water-fowl.

It is not the so-called food birds alone that have felt the sting of his weapons of destruction. Fashion long since decreed that the evidences of man's barbarism, not her hair, should be the crowning glory of woman; that the voice of an operatic singer sounded sweetest when it floated over a sea of dead birds; that the grandest acting of a McCullough, a Barrett, or a Lotta could be heard and seen best when peeped at behind mountains of parti-colored fluffy wings and bird heads set with ghastly death-like glassy eyes.

To satisfy this decree one dealer in London reported a few years ago, an invoice of 32,000 humming birds; another in the same city reported having received 30,000 water fowls and 300,000 pairs of wings. If we add to this list invoices to other chief commercial cities of the world the aggregate will be many millions. He must be blind indeed who cannot see the inevitable result of this astounding slaughter. And the Western Continent furnishes nearly all the victims for this wicked sacrifice.

But we need not go to foreign lands nor even to other States than our own for evidence that this work of destruction is going on to the final and

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utter extinction of the feathered tribe. From personal observation, I know that forty years ago the wild goose made this, Polk county, her summer home. I remember one pair of geese that reared their young in a nest on the top of a cotton wood stump forty feet high, year after year, till finally robbed by a trapper, they abandoned the place forever. This was but thirty minutes drive from our city limits. Within the last twenty years I have found the nest of the wild goose not more than two hours' drive from the Capitol. The sandhill crane formerly reared its young almost in the suburbs of this town, even as late as twenty-five years ago. The same may be said of the bittern and heron and various species of ducks, including the mallard and teal.

The common prairie hen remained here in vast numbers the year round, rearing young that knew no other home.

The ruffed grouse, commonly called pheasants, was abundant along the streams and in the dense thickets everywhere. Quails abound so plentifully that they were often seen running about the cabin doors of the then Fort Des Moines. Meadow larks flitted here and there as one followed the trails through the prairie grass, sang their melodious notes from the top of fence stake or rosin weed or bush, filling the souls of those who had ears to hear with gladness and gratitude to the Creator. In the woodland the wild pigeon built her nest; the trees were vocal with the notes of warblers. The woodpeckers were abundant; nearly every known species of this continent might be seen in an hours' ramble along any of our rivers or streams bordered with timber. The wild turkey, that delicious bird without which we could not in earlier days give thanks, was found in autumn and winter in large troops of fifties and hundreds under the oaks seeking acorns or in the fields were the corn was standing or in shocks, and in summer reared their young here.

The kingfishers scream of delight was a familiar sound along the creeks and rivers, and about the ponds and lakes, yet all these bodies of water were stocked to overflowing with the finest of food fishes, both small and great. The wood pewee, king bird, and other fly catchers were abundant. So, too, were many other birds which I need not now enumerate. Many of these birds which I have named have not only long since ceased to make their summer home in this county, but a large number of them are extinct within our borders. The ruffed grouse drums no more for us; the turkey has gone to join the moa of New Zealand, as far as we are concerned. The prairie hen finds no resting place this side of the far northwestern portions of our State, and there her young are slaughtered annually before they are fully fledged. The woodpeckers furnished bright and shining marks for the gunner, and as a consequence some species are annihilated and all are brought near to extermination.

If you wander about our meadows in spring or autumn you will see but one lark where once a hundred would have arisen at your too near approach. Geese, ducks, cranes, and swans no longer nest within our State, but go beyond, where a few years more of indiscriminate slaughter will drive them further on toward the pole. The quail has yielded to the pothunter. The

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American eagle, once a resident of our State, has been compelled to follow the illustrious example of some of our noted patriots and financiers and fly to the recesses of British forests for his health, where he may rest and recuperate from the effects of wounds inflicted upon him by shotgun and rifle in the hands of our loyal people.

Our favorites, the choicest songsters of our groves are brought low, and instead of their rich melodies, we hear the harsh, tantalizing ungrateful sound of that most unwelcome guest, the English sparrow, in our streets.

And now, in view of all these things, shall we continue year after year, with the shotgun and knife, killing and cutting to pieces the thrush, the robin; the catbird, the goldfinch and the oriole, and assuming to determine as to the value of insects destroyed and the value of fruit eaten, say that the robin must die because the balance is against him? Or that the oriole must be murdered on the old apple tree where her fledglings are cradled because she has plunged her beak into the tempting fruit that hangs around her home.

Can this society afford longer to implicitly allign itself with those who have steadily pursued the bird creation, either wantonly, ignorantly or to satisfy the caprices of fashion and greed for gold, until they have decimated or utterly annihilated many valuable species?

I feel sure that you who have devoted your lives to the cultivating and disseminating of plant and shrub and tree with fruit and flower for the beautifying of the homes of rich and poor alike, all over this broad land, will take a position more in accord with the moral and æsthetical progress of this Christian age, and say that this debasing persecution and destructive warfare waged against the most charming, most beautiful and most wonderful creatures which the Creator has given to man, shall cease.

This is not a question of dollars and cents; it is a question which appeals to the better, the higher, the spiritual nature of man. As well might we discuss the propriety of digging up our rose bushes and of plowing up our flower beds and lawns because they do not pay us, as to talk of killing the familiar birds about our homes because some of them, according to the money value we put upon their services, do not earn what they eat!

Let me conclude with the words of that illustrious friend of birds, that prince of American poets, Longfellow:

Think of your woods and orchards without birds!
Of empty nests that cling to boughs and beams
As in an idiot's brain remembered words
Hang empty 'mid the cobwebs of his dreams!
Will bleat of flocks or bellowing of herds
[—Or an extra box of fruit?]
Make up for the lost music, when your teams
Drag home the stingy harvest and no more
The feathered gleaners follow to your door?
Think, every morning when the sun peeps through
The dim, leaf-latticed windows of the grove,
How jubilant the happy birds renew
Their old melodious madrigals of love!
And when you think of this, remember, too,
'Tis always morning somewhere, and above
The wakening continents from shore to shore,
Somewhere the birds are singing evermore.

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On motion, Mr. Mosier was tendered a vote of thanks and honorary membership.

W. M. Bomberger: I would like to know something about how to destroy birds that injure our fruit crops. My wife tried an experiment with the birds that were injuring our grapes, and that was to scare them away with firecrackers. In this way we saved our grapes.

H. W. Lathrop: I must say that I listened to the paper with a good deal of interest. This bird question reminds me of the story of a couple of Knights, in the days of Knight-errantry, who got into a controversy over a shield. One declared it was a silver shield, and the other with equal earnestness declared it was gold; so they continued the quarrel until they almost engaged in mortal combat. At last, when they found out the facts, as to what the shield was made of, one side was of silver and the other of gold, so I think there are two sides to this question. I listened to what man has done. It is true he drove out the elk and the buffalo; but has he not brought in the lordly Short-horn and the rounded Poll-Angus? I might carry the illustration further, but just speak of this to show that there are two sides to the question.

Charles Patterson: I was much pleased with the paper, and shall read it with a great deal of interest when the report is out.

I would like to know of a way to destroy English sparrows. They are an enemy to the farmer and fruit grower, as well as to our benecial birds. Some recommend feeding them wheat and then poison them, but I cannot get them to eat wheat.

H. W. Lathrop: The best friends I have had among the birds are the hawks. They destroy the field mice. While hawks were plenty mice did but little damage, but lately hawks are scarce and mice are plenty and troublesome. In filling in trees in an orchard it is almost impossible to prevent mice killing them.

Professor Osborn: At one season of the year birds eat insects; then when fruit is ripe they eat fruit, and later they eat grain. The way to do is in spring let them alone, and let them eat insects; and when fruit is ripe if they become troublesome scare them away with firecrackers or with the shotgun if necessary. The English sparrows are deserving of all the censure they get, as they not only do lots of damage, but drive away other birds. The Thrush is one of our best song birds. It feeds on insects, some of which are beneficial, and it eats fruit.

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W. M. Bomberger: The firecracker method will drive away the birds. If a large flock of jays trouble you, light a few firecrackers and throw among them and they will go away. I have seen two reports that the English Sparrow cannot be poisoned with arsenic or Paris green.

R. P. Speer read a paper, subject, Has Climate been Modified by Man?

HAS THE CLIMATE OF IOWA BEEN MODIFIED BY MAN?

BY R. P. SPEER, CEDAR FALLS.

As the diurnal and annual revolutions of the earth, the courses of the trade and return trade winds, and the tides and ocean currents, are constant, we would expect that there would be but little difference between the summer seasons or winter seasons at any given point on the earth's surface. But what we can learn from weather records, it is evident, that in many countries there have been cold and mild winters and wet seasons and dry ones, for hundreds of years; that the climate in many parts of Europe and Asia has been modified by man, has been well authenticated also. In many parts of the old world where the forests have been destroyed, large rivers shrink during the summer time until they become no larger than creeks, but rise during the spring seasons until they are broad, rushing torrents. Large factories in Switzerland, the machinery of which was propelled by water during the entire year, have been rendered useless by the felling of bodies of timber near them, and a consequent shrinkage of the streams.

Many parts of Italy, Greece, Spain and other countries which were favored with more propitious climates than ours, have been deserted by man on account of lack of rains. As the fact has been well established that large forests do cause rains, not only where they stand, but also for considerable distances from them, I will give the principal reason why they cause them. When water at the surface of the oceans, lakes, rivers, etc., is heated by the sun it rises in the air in the form of vapor and is carried by the winds until it comes in contact with something which is cold enough to condense it, when it falls to the surface of the earth as rain. The trees of a forest shade the ground and prevent it from becoming heated by the sun. In woods the surface soil is leaf mould, which is a poor conductor of heat. It absorbs water readily and holds it almost as well as the moss which nurserymen and florists use when they are packing trees or plants for shipment. Careful ex-

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periments have shown that only one-fifth as much water is evaporated from a vessel in a dense forest as from vessels on bare ground outside of them.

During the summer seasons trees absorb large quantities of water from the cold subsoil which they exhale through their leaves into the air; therefore ,we can see clearly that by the shading of the soil, by the effects of the leaf mould in the forest (which is a poor conductor of heat, but a good absorber and retainer of moisture, and by the exhaling of large quantities of water from the cold subsoil through the leaves, that the conditions must necessarily be very favorable frequently to the condensation of the vapor of the atmosphere in, over and to the leeward of forests. I say frequently, because we must not forget that the hight to which vapor rises in the atmosphere is dependent entirely upon temperature. When the atmosphere becomes greatly heated by the sun most of the vapor which it contains will be far above the forests; but when its temperature shall become sufficiently reduced, the vapor which it holds will be near the surface of the earth. Now, let us compare the conditions of the forests which do cause rains by condensing the vapor of the atmosphere during the summer seasons, with with the conditions of our prairies, both before and after they were broken by the plow. Only a few years ago the greater part of Iowa was covered with wild prairie grasses, but at the present time nearly all of the State is under cultivation. The original, native grasses of Iowa were principally of three kinds, to-wit: wire grass, on the dry prairies; slough grass, in the sloughs; and blue joint, along the borders of the sloughs and on flat, peaty soils. The wire grass had but few stomata (pores) and absorbed but little moisture from the soil. When first broken, the surface soils appeared to be masses of vegetable mould and living and dead grass roots to a considerable depth, in which could be traced innumerable old tubular root spaces.

The vegetable mould on the prairies was from two to four or more feet deep and consisted of little clods varying in size from the sixteenth to an eighth of an inch in diameter. The very numerous old dead roots; tubular root spaces, and interstices between the little clods, rendered the soil so porous that rains and atmospheric air entered it readily to a considerable depth. Thirty years ago nearly all the sloughs were so wet that it was difficult to cross them with a team until after mid-summer. By the middle of June then, the dry prairies were covered with a dense growth of grass, which shaded them and kept the soil so cool and moist that the vapor of the atmosphere was condensed and we did not suffer for want of rains, except once in a while in the fall. But the conditions of our soils have been greatly changed. By breaking up the prairies we have destroyed the innumerable clods; the old roots and tubular root spaces, which formed a sufficient number of channels for the free admission of water and air. Instead of being shaded by a thick growth of grass as they were formerly, nearly half of the prairies are now bare pastures, which are constantly absorbing the heat of the sun during the day time, to evaporate the moisture which they contain. When shaded by plants like the prairie wire grass, soils exhale water slowly; but when bare, heated and compact as our pastures are generally in the summer time, they evaporate the water which does find its

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way into them rapidly. Our most common pasture plants, blue grass and white clover and the most common hay-plant timothy, throw their roots out horizontally near the surface of the ground. The pores on the undersides of their leaves or blades are very numerous, which enable them to absorb from the soil and throw off into the air large quantities of water during the day time. The effects of such continued waste of moisture are, that our pastures and timothy meadows are very frequently as hot, dry and hard as a well beaten road, during the growing seasons. When rains do come, it is difficult for them to penetrate soils that are in the condition which I have just described, and the result is, that most of the water runs off over the surface of the ground to the ravines or creeks and is lost. Last September, after a good rain, I found my nursery grounds which had been well plowed and thoroughly tilled, wet to the depth of eleven inches, while in a white clover pasture and in a timothy meadow near by, the ground was wet from two and a half to three inches deep only. Very frequently the atmosphere is very wet, but we get no rain, because it does not come in contact with anything which is cold enough to condense it. On the dryest days of 1886, it was very common to see hundreds of drops of water condensed on the outside of jugs after being filled with cold well water. At such times, large bodies of timber or great tracts of land covered with dense growths of deep rooting grasses or other plants, would have caused an abundance of rain. It is generally not long after the last cultivating of our corn fields until a thick crust is formed on the surface of the ground, which excludes the atmosphere and its moisture from the soil during the remainder of the summer seasons. The rain-fall over the entire surface of the earth varies but little from year to year, but from what I have said it will be very clear, that man has changed the climatic conditions of interior sections of the country, so as to cause local rains or prevent them I have said interior sections of the country, because at the equator, in the track of the south-east trade winds on the eastern slope of the constantly snow covered Andes mountains and at other places near the oceans, rain falls almost constantly.

In such places and in the Great Sahara Desert, the climatic conditions are such that man cannot control them. But it is not often that the atmosphere is charged with moisture excessively in Iowa, and it is but seldom that it does not contain enough to give us satisfactory rains when sufficiently cooled. If the climatic conditions in Iowa have not changed—why did we invariably succeed from thirty to thirty-five years ago in growing heavy crops of first-class wheat on new fields, while we have failed to grow more than from seven to ten bushels of inferior wheat per acre during the last ten years on similar fields which had never produced other crops? Thirty years ago it was generally supposed that we had a great American desert and that Kansas was a part of it. The few settlers who were there at that time, suffered severely for want of rains, while in Iowa we had enough to produce plentiful crops. The native grasses of Kansas shaded the ground but little—in fact the insignificant Buffalo grass was the only grass which could be found in many places. At the time of which we are speaking, the surface of the ground of the greater part of Kansas was so

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bare and hot during the summer seasons that it was impossible for atmospheric moisture to be condensed either in the soil or immediately above it. But as the settlements increased in size and number, and as corn took the place of the Buffalo grass, the rains became much more frequent and during the last ten years the crops of that State have averaged better than the crops of Iowa. It is very evident that man has modified the climate of Kansas by causing conditions which were more favorable to the condensation of atmospheric moisture; but it is also equally evident that he has modified the climate of Iowa by causing conditions which are less favorable to the condensation of the vapor in the atmosphere than formerly. Nevertheless, the time is not far distant when Kansas will suffer more from drouths than Iowa, as the vegetable mould in her soils will be exhausted rapidly, and the evaporation of water from them will be much greater than now. But you may ask, how can we prevent drouths like those of 1886 and 1887? I will answer, by sub-soiling a large share of the State every four years to the depth of fourteen inches and by growing crops which have the characteristics of red clover. I would use the sub-soil plow, because, by loosening the soil to the depth of fourteen inches, I would let in atmospheric air freely to a sufficient depth to condense the moisture which it contains. I would make red clover or other plants which have its characteriseics, leading crops all over the State; because it extends its roots to a great depth in the earth, and because it is a gross feeder and brings up large quantities of water from the sub-soil which is cold enough to condense the moisture in the air which circulates among the clover plants above the surface of the ground. I have noticed hundreds of times that the result of such condensation is, that the soil in a red clover field is generally cold, mellow and moist. From the opposite characteristics of red clover and timothy, it is very evident that if Iowa was a vast clover field we would have no drouths; but it is equally evident that if it was a great timothy meadow or closely cropped blue grass pasture field, it would soon be as dry and bare as a desert.

DISCUSSION.

Silas Wilson: One point of interest to us is the influence on the crop by subsoiling. One piece of land I subsoiled three consecutive years, and planted in nursery stock. It was harrowed thoroughly and planted to corn last spring. It produced 65 bushels per acre, and during the growing season there was not a dry leaf on it. It matured a crop in best shape of any land that I know of, and do not think it was beaten in the State.

J. C. Plumb: The subject of the paper is a subject I have studied a great deal, in relation to fruit growing. Man has modified the climate, as Capt. Speer says, by deforesting, cropping, etc. Yet our statistics tell us that during a long series of years, the amount of rainfall is unchanged by man. Yet in later years we find great variation

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in temperature and rainfall. Some tell us that it is accounted for in changes or rotation of seasons. If that is so, it resolves itself into a question of preserving the rain that does fall, by reforesting. The earth is a great reservoir of water. If we can break our ground deep, like James Smith, (whose paper was sent by Mr. Moffit, and whose land is a natural sand bed, with a reservoir of water within four feet of the surface, which, when the wind and tide sets toward his land, rises to within two feet of the surface) we should not suffer from drouth. In dry weather, plants, like animals, go further to drink. The question is what can we do to preserve the rain that falls each year? I made, I think, the first steel subsoil plow in 1856. I ran it ten or twelve years. I have it yet as a memento. I made a steel subsoil plow because we could not run the heavy cast plow they had east. I ran subsoil plow between rows of nursery trees twice to each row. The result was I got a better growth than I ever got any other way. Subsoiling, good culture and mulching brings the desired result in a dry season. Around our little village we raised 2,000 bushels of blackberries. The soil is rich and was cultivated every week, and sometimes two or three times a week. The moisture came *up* from below and went *down* from the atmosphere, and those plants did not know what drouth was.

H. W. Lathrop: The question of climatology is a very interesting if not a profitable one. In 1837 we had a very wet summer; 1844, 1851, 1858 and 1865 were also very wet. We thought 1865 would be our last wet year for a period of at least seven years, but 1867 was tolerably wet, and since that time we have had no such recurrence of wet seasons. I do not know that we can find any cause for it. We have records from 1840, commenced down at Muscatine by Professor Parvin. Professor Hinrichs began his weather service in 1851, since which time we have had a complete weather record.

I remember reading accounts of the floods of 1844, when steamboats would run through the streets of some of the towns of Illinois.

In 1844 a 300 ton steamboat ran out into Iowa City, over land that is now tillable, and fifteen feet above the water of the Iowa river. These things with our past dry seasons show a wonderful change.

I do not know how we can get anything valuable for dry weather, except by deep plowing. We cannot change the atmosphere above our soil, but we can change the atmosphere that goes through our

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soil. If we have fourteen inches of loose soil, the air will circulate through it, and if air is moist when it reaches the cool soil, the moisture will be condensed and remain in the soil.

Motion prevailed to adjourn to 9:30 to-morrow morning.

MORNING SESSION—THIRD DAY.

Society met pursuant to adjournment. C. F. Gardner, Director of Eleventh District, reported as follows:

REPORT OF THE DIRECTOR OF THE ELEVENTH DISTRICT.

BY CHARLES F. GARDNER, OSAGE, IOWA.

Mr. President and Fellow Members:

I greatly regret that I cannot make as gratifying reports for the past year as I had hoped. My district being composed of the counties of Allamakee, Winneshiek, Howard, Chickasaw, Mitchell, Floyd, Worth, Cerro Gordo and Bremer, there might seem to be naturally a great diversity in soil, and an unequal amount of rainfall. We have all grades of soil, running from the limestone formation through all grades, to the black prairie soil, and from that to sand. Still I find but little difference in the general summing up of results in each county. The rainfall during the past year has been the least that we have ever experienced. In some townships they were favored with local rains, while all around them were people suffering for the want of it. These districts that were so highly benefitted, unfortunately, were of small extent, and far between. While there are exceptions, generally speaking, throughout the district the propagation of nursery stock has been attended with great loss. The stock received by me at my experimental station, however, came out all right, and has gone into winter quarters in good shape with one or two exceptions. It was all set on highly cultivated land, and when dry weather set in the ground was heavily mulched with straw. Very few apples were grown in the district, the trees seem to have made a fair growth, and the wood hardened up well. While there has been some

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cases of blight, I do not think there has been as much as usual. The grape crop was never better as far as I have been able to learn. My vines made a good growth of wood, and were loaded with fruit. No disease of any kind was observed during the season. Strawberries were a light crop at the best; indeed I would not estimate the yield at over one-fifth of an ordinary crop. In many cases they were an entire failure, while I know of a few beds that produced a full crop. Early set plants did much better than could be expected, while those set late in the season did not amount to much. Raspberries of all kinds suffered from want of moisture, and might almost be called a complete failure, at any rate as far as profit is concerned. No blackberries were grown except where the bushes had been carefully covered during the previous winter and well mulched during the summer. Currants were killed generally by a late frost; in our part of the district none were grown except in a few instances, where the bushes were covered with cloth to keep off the frost. This is the first season that I have had my dwarf June berries fail to bear, but the frost killed all the blossoms. Flowers of almost every description were small, imperfect and extremely scarce. Of tree seeds there has been a great scarcity, with the exception of Black Walnut and Butternut. The past season has been very unfavorable for the transplanting of Evergreens, as they are generally handled, on account of extreme dryness of the atmosphere, but where the tops have been cut back and the roots kept moist, I know of no failures. Evergreen trees, in time of drouth, must be handled properly, not only in packing, but in unpacking. When the boxes are first opened, water must be sprinkled on the roots before they are taken out, then they can be safely removed and heeled in. Too much care cannot be taken to preserve the proper moisture of the roots. On the whole, I think there is a growing interest in Horticulture in the District, and I hope that a better report can be made for the coming season than has been made for the past.

DISCUSSION.

N. K. Fluke: I would like to ask as to the magnolia. It does not grow with me, although the trees I got started.

C. F. Gardner: I have not been an extensive grower of magnolia *acuminata*. Those I got from the experimental committee started but did not grow; but my old trees behaved well. They transplanted well and I never lost any before. I think there are two kinds. I compared those I got for experimental station with those I had, and thought there was a little difference. I think I got the seed from Ohio for my old trees. They are as hardy as a black walnut in Mitchell county. Sometimes the point will kill back like a butternut.

N. K. Fluke: I would like to know where the experimental committee got the magnolia they sent out to experimental stations.

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J. M. Elder: Mr. Gardner referred to local storms. In some localities there was a great deal precipitation than there was in others close by. 1886 was considered a dry year, yet certain localities had heavy rains. From April 1st to 15th of May nearly ten inches of water fell; this was between one-third and one-half of normal precipitation for a year. At Algona, thirty-two miles distant, only about one-third as much rain fell during that time. On one occasion, during a very few days, nearly nine inches of water fell, while fifteen miles away, the rainfall was so little as not to be measurable. This matter of difference in rainfall may explain the difference in reports from different localities as to behavior of varieties and the amount of yield of certain crops.

John Wragg: I think the difference in the appearance of magnolia trees, related by Mr. Gardner, is accidental—caused by the difference in condition of the trees compared. I have sometimes had the same difference, but concluded that it was caused by the different condition of the trees. I think that the trees sent last spring were not in first-class condition. Last spring I got two of those trees from Mr. Gardner. They died in July. As to seeds, those from the north will do better than if seeds were brought from the south. On the grounds of James Mathews, of Knoxville, are old trees from which I am getting seed and will give thom a thorough trial.

President Patten: Does Mr. Gardner consider the magnolia a valuable tree for our collection?

C. F. Gardner: Yes, they fill a place that we have no other variety that will do as well. I would not plant it extensively, but would plant for ornament and variety.

C. W. Burton: I got magnolia and tulip trees from Ohio. After one year they never kill down. Tulip is perhaps hardier than the magnolia. The roots should not be exposed to sun any more than a fish to the air. They will stand the coldest winter.

A. G. Williams: In the forests, seedlings are grown in the shade, and no doubt but many trees that die would have lived if shaded when set out. Even when set out and foliage dries up, if shaded they will start again and survive.

N. K. Fluke: I shaded my trees but they did not survive. We have tulip trees with us a foot in diamater.

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John Wragg: I think the trouble comes in the first two years. Mr. Strohm has a growing on his place, the only one I know of in the state. I have failed to make it grow.

A paper on insect enemies, by Dr. A. Hoffmeister, was read by Prof. Osborne.

INSECTS AND THEIR USE.

BY A. W. HOFFMEISTER, BURLINGTON.

It is asserted and believed by many good people that nothing is created without use and benefit, and that man is made to be master of all creation, and therefore every thing must be created for the use and benefit of man. But this belief is erroneous, at least as it concerns the direct use or benefit to man.

It would be difficult to find a farmer or horticulturist, who would think useful the Colorado potato bug, the cabbage butterfly, chinch bug and the host of other insects, which infest, affect and injure almost any thing he works hard to raise a crop of, or such insects which attack his horses, cattle, swine and sheep, and poultry; or to find any other man to assert, that the insects, which attack his carpets, woolen fabrics, feathers, furs, attack and spoil his eatables and destroy his collections, are of use or benefit. And where is the use of such tormentors, as the mosquitos, the pediculi and the pulex?

With our present knowledge, we have to confess that we cannot see any use of them, nor that we are master of them, but that they are rather here to increase the "sweat of our brow to eat our bread in;" but when our knowledge increases, we may find out that they all are links in the great chain of the Universe, and that no link can be broken without destroying the harmony, unity and aim of the same though the majority of the insects appear to us at at present, either harmless (to man) or injurious. The are some, which may be considered useful, either directly or inderectly in a higher or lesser degree, and of such I want to write.

It cannot be the intention of this by necessity short article to go into detail, but a general idea will be given what insects are and can be of use to man and how and therefore we will consider the different orders of insects separately.

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ORDER HYMENOPTERA.

The family of bees, as is well known, are of great use to man, and for their products, honey and wax are extensively cultivated.

The wasp, some species at least, furnish their young with caterpillars and other noxious insects for food, helping thereby to lessen the numbers of these noxious insects.

The different genera belonging to the family of Schneumonidæ are of immense service to the agriculturist as they deposit their eggs into caterpillars and the larvæ of colaoptera and hymenoptera.

The Practotrupii, very small hymenoptera, are parasitic to the eggs of insects and therefore also of great use to man.

The Chalcididae, also small insects of which some infest eggs and larvæ of other insects, pray upon Aphides, the larvæ of the Hessian fly, etc. The gallflies (Cynipidæ) furnish us the galls of commerce for the manufacture of ink, etc.

ORDER OF LEPIDOPTERA.

This order contains a great many of injurious species, but also several of great use, namely the silkworms, which furnish us the silk, and the silkwormgut for different use. The butterflies enliven the scenery in the warm season and with the moths and sphinyes, contain many beautiful and gaily decorated species.

THE ORDER DIPTERA

contains many annoying and injurious pests, as the housefly, horse, cattle and sheepflies, ticks, the palicidæ musketos, mosquitos, and only a few species somewhat of use to man, namely the family of syrphidæ, whose larvæ feed on plantlice. The larvæ of different flies act as scavengers, as they deposit their eggs on decaying vegetables or dead animal matter, which the larvæ consumes.

THE ORDER OF CALEOPTERA

contains quite a number of species beneficial to man. The Cicnidelidæ and Carabidæ in their larvæ as perfect state live on other insects, especially on some very destructive caterpillars (army worms, span worms, etc.,) while the waterbeetles feed on insects which frequent the water.

The Silphidæ, Staphilinidæ and Nitidulacie act as scavengers of dead animal and vegetable matter. The larvæ of some of our "fireflies" have been discovered to prey on the larvæ of the Curculio and similar insects.

The Cantharidæ are used in medicine and the Coccinelidæ live on plant and barklice.

OF THE ORDER OF HEINIPTERA.

No good can be told, but that the family of Coccus furnishes us the cochinial insect which gives us the cochinial; and some species of Reduvius, Avma and allied species feed on different injurious insects, amongst which the Colorado potato beetle.

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THE ORDER OF COTTIOPTERA

Are still worse, while it contains almost all injurious insects, grasshoppers, etc., there being only the family of Mantidæ which live on other insects.

IN THE ORDER OF NEUROPTIRA

The family Perlidæ and Ephemeridæ are of use, that they supply a great deal of fish food in their larvæ as well as in their perfect state. Their larvæ too, may act as scavengers. The larvæ of the Libellulidæ live on water insects, and the perfect insect on insects of the air. The larvæ of Corydalus is used as fish bait. (Dobson.) The larvæ of Chrysopa lives principally on aphis, and the larvæ of Myrmeleon on ants and other insects. The Phryganidæ in their larvæ state (Caddis worms) are also water scavengers and live on vegetable matter and small aquatic insects. They furnish also some fish food.

Besides the above enumerated uses of the insects, we must also mention that some (Locustidæ and others) are used by uncivilized and even by civilized people as food and nourishment.

Their instrumentality in the foundation of plants is well known, and many varieties and species may have been caused by them.

That they furnish food to many birds and other animals is also well known.

Collectors make use of insects (especially ants) for skeletonizing small animals.

There is no doubt that many insects, of whom we know no use at present, may help to remove hidden causes of evil or perform acts of benefit and good which are yet secrets to us with our present knowledge.

Many persons are dead to the beauties of nature; to these the insect world cannot be anything else but "nasty bugs," while others find an immensity of pleasure in them and in their study, and as the generations of insects change more frequently and rapidly than the generations of the higher classes of animals, they afford the best material for the study how varieties and even species are formed.

A. W. HOFFMEISTER.

DISCUSSION.

C. W. Burton: I would like to know where we can get a supply of the insect that feeds on the Colorado beetle.

Prof. Osborn: They are all over the country, but are not in sufficient numbers to destroy all the potato beetles; but no doubt that the less damage of potatoes, for the past few years, can be attributed to their work. Lady bugs and army bugs destroy eggs and larvæ of potato bugs.

Are the Bees Our Friends, was the title of a paper read by Eugene Secor.

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ARE THE BEES OUR FRIENDS?

BY EUGENE SECOR.

In some localities, where grape-growing is the chief industry, and where, in certain seasons of the year, or in seasons peculiar in themselves, the honey bees have given the fruit growers more or less annoyance; some persons who have not studied the structure and habits of bees, and whose observations have not been as careful and thorough as the subject demands, have been ready to declare them a nuisance and to banish them as an enemy to horticulture; hence, the question at the head of this paper is not only an interesting one, but important. That they do occasionally annoy grape growers, and perhaps others, is true. Those of us who keep dairy cows know that *they* sometimes break out of their enclosure and give us trouble and annoyance in consequence, yet we should hardly be willing to forego the luxuries which they furnish us, nor forget their general usefulness on so slight a fault. If good qualities overbalance the bad, bees cannot be an unmixed evil.

On the theory that everything was created to serve some good purpose in the economy of nature, what was the purpose in the creation of the honey bee? Was it only that man's palate might be tickled with the delicious nectar which she finds hidden in the delicate chalices? I think not. The honey is of only minor importance. I believe it was the Divine purpose to minister to our necessities and enjoyment, but in a different and more important way.

"Male and female created he them" was no less true of plants and flowers than of man. In a good many of the species the sexual organs are not in the same flower; in others they are developed on distinct plants; in still others, although the flowers are hermophradite, the anthers and stigmas do not ripen at the same time. Some means of carrying the pollen dust from flower to flower or from plant to plant, is necessary. The wind is one of the fertilizing agencies, but the wind doesn't always blow during the brief opportune period when the pistils are ripe for receiving the life-giving dust. And if rains are frequent, keeping the pollen germs too damp to be easily carried by the favoring breeze, many plants would fail to mature seed and fruit but for the insects that perform this important service.

Charles Darwin, that eminent English naturalist, whose careful experiments have added so much to our knowledge of plant and insect life, states in his work on "Cross and Self-Fertilization," that out of one hundred and

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twenty-five species that he covered with netting excluding insects when in bloom, more than half were either entirely sterile or produced less than half the number of seeds of the unprotected plants. I will cite one only of the many so treated by him, namely, white clover. I quote:

"Several plants were protected from insects, and the seeds from ten flower-heads on these plants and from ten heads on other plants growing outside of the net (which I saw visited by bees) were counted; and the seeds from the latter plants were very nearly ten times as numerous as those from the protected plants. The experiment was repeated on the following year; and twenty protected heads now yielded only a single aborted seed, whilst twenty heads on the plants outside the net (which I saw visited by bees) yielded 2290 seeds, as calculated by weighing all the seed and counting the number in a weight of two grains." He says: "The most important of all the means by which pollen is carried from the anthus to the stigma of the same flower or from flower to flower, are insects belonging to the orders of *Hymen-optera, Lepidosstera and Diptera.*"

Bees are the love-messengers which carry on the courtship and hasten the marriage of the blushing blossoms. They furnish the means of locomotion and make it possible for distant and non-related flowers to meet in happy wed-lock. Other insects do indeed play some part in this important work, but no other honey or pollen-gathering insect increases with such rapidity in the spring before the fruit trees and small fruits blossom. Bumble bees are the chief fertilizers of red clover, because of the length of the corolla, but as only the queen lives over the winter, and it takes her so long to rear her young, the first crop is ripe before her progeny are numerous enough to do much good, hence, only the second crop is depended on for seed.

We have another eminent English authority, Cheshire, for the statement that gooseberries are absolutely dependent on insects for fertilization. He states that the failure of this crop so often attributed to late frost, is often due to non-fertilization. The same author also says in reference to apple blossoms that the stigmas mature before the anthers and that every blossom needs five independent fertilizations to make a perfect apple. He says that many of the wind falls are traceable to imperfect fertilization. Out of 200 apples picked up at random after a wind storm all but eight were traceable to this defect. The reason nature has stored nectar in such abundance in the orchard fruit blossoms is to entice the bees to travel over them and thereby secure seeds to propagate the species.

But a still more important service rendered by them is that of cross-fertilization. Nature appears to abhor the marriage of near relatives. Many plants although provided with both male and female organs in the same flower are yet guarded from the baleful effects of inbreeding by the anthers maturing at a different time from the stigmas as before stated. Others are self-fertilizing, but at the same time are much more fertile if the pollen from a distant and non-related plant be applied. In other words the pollen from a distant and non-related plant of the same species is much more prepotent than that from the same flower or same plant.

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Darwin's painstaking experiments with self and cross-fertilization carried on for more than seventeen years and followed up with numerous plants to the tenth or twelfth generations, led him to these conclusions: first, that cross-fertilization is generally beneficial; second, that self-fertilization is generally injurious.

Now the especial province of pollen and nectar-gathering insects is to insure the cross-fertilization which is so beneficial. Nature doesn't usually stake all her chances on a single pre-adventure. It is both increase and improvement that are desired. If entirely dependent on insects, then without them there would be no seeds and no increase. If entirely dependent on the wind, then blossoms during a calm would die of sterility. I think you will find it true, however, of every plant or tree that secretes nectar in abundance, thus inviting the frequent visits of bees or other insects that it is either sterile without insect aid or else the crossing which is thereby insured is highly important.

Cross-fertilization is one of the most interesting as well as important studies in horticulture and floriculture. Without it advance is impossible. Every apple would be like every other apple, and every flower as stereotyped as a printer's proof-sheet. Variety in color, in flavor and in fragrance are largely, if not entirely, due to cross-breeding.

In a paper read before the nurserymen's convention last summer our President Patten stated that about seventy-five per cent. of all our improved fruits had come by chance. How much of this, think you, was due to the busy bee in its quests after the yearly drop of nectar hidden for its finding? "Her honey is but a fraction of the results of her labor. Man has had tiny helpers that he knew not of. While he, for *seasons*, has selected and hybridized, they for *ages* have, with their little powers, toiled along perpetuating every movement of the world of flowers toward the beautiful."

Now as to bees injuring fruits: I said at the outset that they occasionally annoyed the fruit grower. Perhaps it would have been more proper to say fruit pickers. If grapes or other soft fruits get bruised in picking, or if they burst from overripeness or damp weather, or if from any cause the skin is abraided so the bees can get at the soft sweet pulp they will tumble headlong over each other in their haste to get at the booty.

Those who have made a scientific study of their structure maintain that a bee's mandibles are not for biting or cutting like those of the hornet or wasp. They can only mould the wax that forms the comb at a high temperature. If they could bite the skin of a grape to get its juice, why don't they bite open the corolla of the red clover blossom to get the abundant nectar which they can scent but cannot reach? Here again Darwin's observations are valuable. He says he has many times examined the blossoms of the red clover, and often seen hive bees sucking the nectar from the sides of the corollas near the base from little holes bored through them, but he does not arraign the bees for boring these holes. They only appropriate what other insects have made it possible for them to obtain. He says: "As far as I have seen, it is always bumble-bees which first bite the holes, and they are well fitted for the work by possessing powerful mandibles."

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Perhaps it may not be generally known that there is, in Illinois, an apicultural experiment station, established and supported by the government, for the purpose of determining just such disputed questions as this. In the Agricultural Report for 1885 may be found a very full account of the means used to determine the possible injury bees can do to sound fruit. A large screen house was built and several colonies placed therein, subjected to all the conditions which might be supposed to increase their pillaging instincts, viz: drouth, warmth and starvation. After being kept confined in this state a few days, twenty-three varieties of grapes, besides peaches, pears and other soft fruits were hung in the house or placed on shelves; and while the bees visited them constantly in search of food, not one was injured by them. Others were dipped in honey. Of course the latter was quickly appropriated but not a skin was broken. Others were placed in the hives, and although polished like glass by constant travel, none were injured. The limits of this paper will not allow me to pursue this part of the subject further. If anyone wishes more testimony he should read that candid report by a disinterested observer.

DISCUSSION.

W. M. Bomberger: The gentleman asked me if I had seen bees on the blossoms of grapes, especially on Concords? Yes, I have. It has been suggested by some, that a good way to fertilize grapes would be to set, here and there, a plant of a male or pollen variety, and allow them to run up higher than the other varieties in the vineyard; and this would give a better chance for pollen to be carried by bees and air, than if all were on level.

President Patten: I wish to present to the society a practical example of fertilization. This apple I show you is a seedling of the Soulard crab; one of the bitterest of the wild crabs. This is nearly sweet, only a slight trace of the astringency or bitterness of the Soulard crab. Some of our best horticulturists have doubted our ability to make a cross, of common apple, with the wild crab. This you see is changed from the form of the Soulard, to the form of the common apple. This is supposed to be a cross of winter Harvey; as I cut limbs of that variety and put in Soulard when in bloom. This is probably the first cross of common apple with wild crab. Usually the cross between the apple and the crab family are small; while this is about as large as a Romanstem. This is nearly sweet. The winter Harvey is not sweet, but there may be a cross in the winter Harvey that was sweet. There was no other fruit, at time this cross was obtained, anywhere near, except possibly Grimes' Golden and sweet

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June. This apple has very few seed and there has been no attempt at formation of others.

N. K. Fluke: In different talks on fertilization, one man states that it is necessary to make five different applications of pollen, in order to insure perfect fertilization. I do not think this necessary; out of a peck and a half of pears that I saved all seed from only got .

Professor Herbert Osborn read the following paper entitled, The Study of Entomology in Relation to Horticulture.

THE STUDY OF ENTOMOLGY IN RELATION TO HORTICULTURE.

BY PROF. HERBERT OSBORN, AMES.

Your committee has favored me with a topic which though full of suggestive thoughts which might be expected to interest and instruct, is still so broad that it seems hardly possible to enter upon it in the brief time allotted to this paper. I have thought it better therefore to confine what I have to say on that topic to a few general remarks and to occupy a part of my paper with a discussion of some of the insect foes of our most important fruits.

Entymology as a science and horticulture as an art or industry meet in many places and it is next to impossible for the fruit grower to progress far in his branch without finding some of these places of meeting. He must perforce recognize the effect of insects on his cherished crops and the next steps leads him to study their nature and habits at which point he must enter upon the domain of science. On the other hand the entomologist has but half considered his science if he stops with the structure and classification of his specimens. To know all of his insect he must study its life history, food-habits, etc. And in so doing he cannot avoid inquiring into matters in which the horticulturist may have preceded him.

It is on the common ground, where a knowledge of the life history, habits, etc., of the insect become essential to the application of remedial and preventive measures, that arises applied or economic entomology.

Bearing this in mind it is not difficult to understand that in the gradation between those facts which are of purely scientific interest and of no present practical application, and those which are of strictly economic bearing, there is opportunity for very different estimates of the value of contributions to the subject as a whole. It should be remembered, however, that much of

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entomology which seems useless from an economic standpoint is essential as a basis for the building up of the science in even its practical bearings. Precise nomenclature and accurate descriptions are as essential here as in pomology where you will doubtless all concede the necessity of careful discrimination of species and varieties.

But, not to pursue this matter further, we may say, from the practical standpoint, the whole question resolves itself into the effect of insets upon the production of fruit, and I need hardly remind you that this effect is by no means one-sided. While the most apparent effect is that of decrease in production from the ravages of noxious species the important place filled by insects in fertilization of fruit is too familiar to all cultivators of fruits and flowers to need mention. Aside from these two grand divisions of insects in their relation to fruit growing, those which decrease or prevent production and those which render production possible, there is the great army of parasitic and predaceous species which tend to counteract the effect of the injurious ones and thereby assist production. In a comprehensive view therefore, taking all factors into consideration, there is reason to believe that the fruit growers is dependent on the insect world and that the extermination of this group under existing natural laws, would be to him the greatest of calamities.

From the economic standpoint we have little to do with the species of value to the horticulturist. Nature minds her own business and these minute allies of the husbandman perform their duties unasked though not unrewarded. The only policy to be adopted regarding them is that of non-interference or if possible one of intelligent assistance unless the fruit grower wishes to become a fruit breeder and control the production and improvement of plant breeds by selection and crossing as the breeder of fine stock does with his herds of cattle, horses, sheep, etc. Indeed, interference with the processes of nature is always attended with hazard and should only be resorted to with intelligent regard for the results. It seems to me the great argument against the use of poisonous solutions for certain insects is the indiscriminate slaughter that must result whereby the useful perish with the injurious. The general application of poisons for the codling moth though of priceless value to the fruit grower demands a careful understanding of all the conditions connected with its operation. If applied while honey is still secreted in the blossoms it must be taken by the honey gathering insects and must cause the loss of hosts of these while engaged in their office of fertilization the bloom. Honey in the flower is for the sole purpose of attracting insects. Its presence is a certain indication of the need of assistance from the insects attracted by it. What must we expect then if the reward offered by the plant for the service of the insect is changed by the careless horticulturist into a cup of deadly poison. This one instance will illustrate I think the need of intelligent action where interference is resorted to. Applied too early and the insects necessary to fertilization may suffer; deferred too long and the larvæ of the codling moth will have penetrated the young apple where they are entirely secured against the poison.

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We shall not attempt here further consideration of the insects beneficial to the horticulturist. Their importance will, I think, be conceded by all, but, since their operations do not demand the attention of the cultivator they have never entered largely into the consideration of economic entomology. With insects detrimental to the horticulturist, however, the case is far different, and the literature of entomology and horticulture is crowded with discussions, wise and otherwise, relating to the habits of injurious species and the methods by which the losses they occasion may be avoided.

We frequently see the statement that when Nature is left to herself the opposing forces are kept so evenly balanced that no one element is allowed to preponderate and no wholesale deviation can result from the increase of any single species. While the operation of this as a general law is quite evident, there must be at times temporary lapses when that balance even in Nature is disturbed and in the readjustment species and even whole groups of animals or plants may become annihilated or so overshadowed by the dominant form as to assume an obscure position.

Artificial cultivation with the consequent massing of certain forms of plants is certainly a disturbing element productive of wonderfully altered conditions and these in many cases operate greatly to the advantage of injurious species.

At this point man's interference becomes not only desirable but absolutely essential to the culture of crops affected by the increase of insect foes. To talk of reverting to a state of nature, to desist in the cultivation of certain crops in the masses necessary to our civilization is to admit our progress a farce and our subjection of the forces of nature abandoned. To wait for nature to restore her disturbed balance is equal folly. Our crops might be destroyed year after year for centuries before such a policy became effective.

To give even a summary of the lossess sustained in orchard, garden and forest from the attacks of insects would be to overburden your patience. I will attempt only a brief mention of some of the more striking. I may premise that plants in every part, root, trunk, branch, leaf, blossom, fruit, from bark to heart, are alike brought under contribution by these little depredators. Of the root infesting forms it is sufficient to mention the root-lice of the apple trees, and the pylloxera of the grape which for a time threatened the entire grape-growing industry of the world. The discovery of the applicability of bisulphide of carbon to the root form of this pest not only marked a revolution in the treatment of this insect but developed a subterranean insecticide that made an epoch in the treatment of a host of root-infesting insects.

Of species which infest the bark and wood of the woody plants or burrow in the stems of annuals there is an unnumbered host. Their work, though often long unnoticed, is constant, and the results in the aggregate enormous. The borers and bark beetles of orchard and forest trees will need mention only to bring this class to mind. Unfortunately there is as yet no known method by which they may be destroyed with such certainty and cheap-

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ness that applications on a large scale, as in extensive orchards and forestry plantations are practicable.

The insects producing the most noticeable effects on the plant are those attacking the leaves and tender twigs. These may work in two ways the distinction of which, as pointed out in previous reports, is an essential to the proper application of remedies. Those which devour the leaf as a whole or in part, as potato beetles, canker worms, and in general all the plant feeding beetles and caterpillars are readily destroyed by the use of poisonous solutions. This method first developed in destruction of potato beetles has proven one of the greatest advances in economic entomology. By its use potato beetles, flower beetles, canker worms, cotton worms and many other species are now so readily controlled as to cease to be a source of dread to the cultivator. When it is remembered that the potato beetle alone caused the loss of the whole crop in many places for several years in succession, the importance of this remedy is apparent while the gain in other directions is especially prominent.

The insects which simply puncture the leaves or twigs and pump out the contained juices, such as the bark lice, plant lice, plant bugs, etc , have been among the most serious foes to fruit culture and the most stubborn pests to subdue. The discovery of the great value of emulsified kerosene for these pests has opened a new future in this direction, and there is every reason to believe that the immense losses from this class of insects so far as the fruit-grower is concerned need occur no longer. The possibilities with this insecticide are probably only partially developed and as special methods of application are devised it will doubtless be adapted to many insects for which it has not yet been used.

The insects which attack the buds and blossoms thus preventing growth and fruiting are numerous and produce results far in excess of their importance, as judged by their size or the apparent damage to the plant. The punctures of the tarnished plant bug, the gouging of weevils and eating of cut worms as well as the work of certain leaf rollers and bud moths all operate in this manner. Here, too, we have immense losses in crops by the prevention of fertilization. Some of your members will recollect that five years ago I called the attention of this society to some observations on the injury to the essential parts of the blossom before fertilization had taken place caused by the minute insects known as thrips. During the past season an insect of the same kind probably the same species has been reported as extremely destructive to the strawberry crop in southern Illinois from working in exactly the same manner, namely, attacking the styles and cutting off the possibility of fertilization. My own observations since presenting the matter to you five years ago have only served to confirm my opinion that in certain seasons this source of loss is serious and wide spread extending to certain farm crops as well as to fruit.

The insects living in the fruit, codling moth, curculio, apple maggot, etc., etc., will serve to complete this hasty review of the method in which insects affect the production of fruit. Reference has already been made to the

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value of poisonous solutions for codling moth and the necessity of proper application of the remedy.

Enough has been stated I think to show the intimate relation of entomology and horticulture and that the study of the former, in its applied sense, is of great importance to the latter. It must not be supposed however that this study in its practical bearing can be entirely delegated. All the results obtained by the researches upon life-history, habit, etc., of insects will prove useful to the cultivator only in proportion to their intelligent application. To this end I deem it important that every cultivator should make himself familiar with, at least, the more prominent features of insect life.

The question may be asked how may this knowledge best be obtained, and since this is a question which often comes to me in the way of inquiries as to books on entomology which can be recommended it may be in place here to give very briefly some hints in this direction, not referring to study requiring costly apparatus. A simple hand lens magnifying from ten to fifteen diameters and costing one or two dollars is the only article (except pins, needles, bits of cork, and sharp knife, which every one has at hand) which is really essential. Even without the lens many facts can be learned, but no one studying insects by observation will long remain without this accessory. The points to be studied may first be the mouth parts of the insect together with their habits of feeding. This will determine in many cases the kind of remedy applicable. Next the transformations of the insect observing the different stages into which the specimen in hand changes with the location adopted for each stage including the time and place of deposition of eggs. Many insects in immature stages will, if confined in a glass jar, old fruit can or some other receptacle by a cover of mosquito netting or cheese-cloth, and see their natural food pass through the successive stages to adult form, much the same as in their native haunts. Many points of interest and profit may be determined in this way. Thus the habits of different species in different stages of development will become familiar and the proper time to apply remedial or preventive measures easily understood. Related to this will be the observation of the parasitic and predaceous insects affecting injurious species. As regards the application of insecticides there may be great saving of injury if the cultivators provides himself with the necessary spraying apparatus before any immediate necessity calls for its use. By a few trials of the apparatus or by experimenting on some insects even if not particularly destructive he can learn proportions of his mixture and the best way to manipulate the spraying machine and be in readiness for any insect invasion as soon as it comes. The different forms of spraying nozzles may be tried and their use under different conditions determined. I have not referred to books as I consider the best way to begin the study of insects to be from observation of insects themselves. Books however which record the experiments and observations of others are a most valuable assistance, and such as can be secured should be used for reference and to verify or to correct ones own observations.

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I had intended giving a considerable portion of this paper to a discussion of grape insects, but it has already grown beyond my expectations and I can give only the briefest mention of one or two.

The grape-vine flea beetle (*Haltica Chalybea*) though a common pest in some parts of the country has until recently been rare in this State.

It has now appeared in destructive numbers in several places and merits at least a short notice.

The insect is first observed early in spring when the beetles, small blue-black insects nearly a quarter of an inch in length, which have passed the winter in the adult stage, gather upon the opening leaves and blossoms and by their depredations cause serious loss to the vine in growth, and particularly to the formation of fruit, by eating the blossoms. This work is kept up for three or four weeks and during this time also the eggs are laid which shortly bring forth a supply of small dark colored larvæ which continue the work of destruction commenced by the adults. The adults in the meantime gradually disappearing. The larvæ attain their growth in about a month and descend to the ground and burrow in the earth to pass through the chrysalis stage. This stage occupies two or three weeks when the insect emerges as a beetle which again attacks the leaves of the vine. As the leaves by this time are large and numerous, however, the damage is much less noticeable and as a rule the insect attracts but little attention. These beetles remain on vines till the approach of winter when they seek shelter among leaves or rubbish at the surface of the ground. Doubtless the most satisfactory method of destruction will be that of applications of poisonous solutions early in spring or while the beetles are feeding on buds and blossoms. The spraying can then be done very thoroughly as there are no leaves to interfere with the distribution of the fluid and there is no danger at this time of the fruit getting enough poison to make the use of it questionable. By destroying the beetles the deposition of eggs will be prevented and even where already laid there is the probability of enough of the poison adhering to the vines to kill the newly hatched larvæ when they commence to eat.

The Grape Vine Leaf Hopper, (*Erythroneura Vitis*) is a common pest throughout the country, but the past season was more than usually abundant, probably because of the favorable conditions resulting from the dry spring. The adults are very active creatures and it is difficult to approach them close enough to examine them. The young are less active, and by using a little care the leaves containing them can be picked and the young examined closely. Adults may be found in early spring or even in winter secreted under leaves in forests or thickets and do not accumulate on the vines till the leaves are well started. Soon after their appearance on the vines young hoppers will begin to a appear and these attain their growth by about the first of July and from this time on till in the fall both adults and young are found in abundance. There is considerable variation in individuals and at least three or four forms have been described as distinct species which may all be considered as the same. Along with these, too, will be found numerous individuals of the same habit but evidently belonging to a

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closely relate genus, since they differ in the veining of the wings. These insects are destructive mainly to the thinleaved varities of grape such kinds as the concord suffering only slightly even in bad years.

The leaf-hoppers are [so active as adults and so fully secreted under the leaves at all times that it it is difficult to apply remedies but by using a cyclone nozzle and operating it among the leaves especially from beneath, they can be reached with spray quite effectually. The fluid used should be a dilute emulsion of kerosene. Two or three percent kerosene is sufficient.]

L. A. Williams invited the society to hold next annual meeting at Glenwood.

D. A. Porterfield invided society to meet at Traer, and presented letters of Mayor and W. H. Brown, asking the society to meet there, and tendering use of Opera House.

L. A. Williams moved that the society meet in Glenwood next annual session.

After considerable discussion, a motion was made to strike out Glenwood and insert Des Moines; amendment carried; motion as amended carried.

A paper on Notes of European Forestry, by C. Beckington, was read by the secretary, as follows:

NOTES ON EUROPEAN FORESTRY.

BY CHAS. BECKINGTON.

The legislature of Iowa should be asked to authorize the immediate employment of a competent forester to examine and report on the needs of the State in forestry and tree planting. After that would come organization and work. If this is not done, and soon done, even this generation will have reason to reproach itself for want of foresight; and the next generation will be justified in maledictions which we might not like to hear.

In addition to this, I suggest that the legislature be asked to pass an act tending to promote tree planting along the highways, and all such roadside planting be under the control, or at least that planters act in harmony with present road officers.

This is distinct from forestry proper, but it is in the nature of a beginning; and a blessed one, of far wider influence and benefits than one would imagine.

In France all roadside tree planting is under the control of the depart-

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ment of roads and bridges; and all products of such growth are for the benefit of public roads.

In a country comparatively without fences, these trees indicate the proximate limits of their narrow but excellent roads; keep teams from going down embankments, or into ditches, or from trespassing on bordering fields.

The French rarely plant fruit trees along the highways, because of the injury done to the trees by unlawful fruit gathering.

Out of nearly 19,000 miles of public roads in France, nearly 11,000 miles are bordered with trees. The nature of the ground along 7,000 miles of public road does not admit tree planting. The trees planted should consist of elm, poplar, acacia, ash, sycamore and lime. The apple is planted along the roadside only in two departments; the pear in two; the cherry in six, and the chestnut in six.

Taste, judgment, and the teachings of experience, are all exercised in this roadside tree planting; not merely the resulting products. Their use as guides and land marks are considered; summer shade, the beauty of the landscape, and the comfort of men and animals.

Mr. Puton, Director of the National Forestry School of France, told me the officers of roads and bridges are now careful not to plant poplar trees, which throw off the little crowned seeds, because of the annoyance these flying seeds give to men and animals.

In Germany, on the contrary, the roadside trees are mostly productive fruit trees. Basket willows are found in a few places suited to their profitable growth, but fruit trees most generally strike the eye. In Germany law is law, and so vigorously enforced that you will see nearly as many apples, cherries and plums on the trees toward the side of the road as on the side toward the field.

In many districts of Germany the products of these roadside trees are sold to the highest bidders on the trees before they become ripe, and the proceeds are appropriated to road improvements.

In some districts of Alsace and Lorraine the roadside cherry trees often bring a considerable income.

In southern Belgium, besides fruit and shade trees, they cultivate as a roadside tree, the Sorbier, a tree belonging to the family of our Mountain Ash. In autumn, the road officers sell to the highest bidder the right to catch and kill the birds that gather upon the trees for their berries. A Belgian gentleman told me the income from this source was quite worthy of notice.

In conclusion, I urge a prompt inquiry into the forestry needs of the State.

2. A legislative enactment promoting roadside tree planting.

3. That your society do all it can to secnre the establishment and support of some good journal of Forestry.

Adjourned to meet at 2 p. m.

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AFTERNOON SESSION—THIRD DAY.

REPORT OF COMMITTEE ON FRUITS.

Your committee, after a careful examination of the fruits on exhibition, have awarded the following premiums:

J. W. Murphy, county collection, 1st premium, Mills county	$20.00
A. F. Collman, county collection, 2d premium, Adams county	10.00
A. F. Collman, individual collection, 1st premium	10.00
A. Branson, individual collection, 2d premium	5.00
George Van Houten, plate Ben Davis	3.00
George Van Houten, plate Rome Beauty	3.00
A. F. Collman, plate Janet	3.00
A. F. Collman, plate Roman Stem	3.00
J. W. Murphy, plate Red Romanite	3.00
Jonathan Thatcher, plate W. W. Pearmain	3.00
C. B. Andrews, collection seedling apples, 1st premium	10.00
N. T. Case, collection seedlings apples, 2d premium	5.00

A plate of Northwestern Greening, shown by Mr. J. C. Plumb of Wisconsin, is deserving of special mention.

President Patten had on exhibition a seedling of the Soulard crab, which is especially worthy of notice, as showing the improvement by one cross; nearly all the acidity has been bred out of it.

N. T. Case exhibited a fine collection of plums and small fruits in glass jars.

In Mr. Case's collection of seedling apples was one especially worthy of notice, on account of its quality, appearance and apparent keeping qualities. (Mr. Case calls this apple the Twelve Month.)

J. THATCHER,
N. K. FLUKE,
EUGENE SECOR,
Committee.

On motion the report was adopted.

Best shrubs for the Lawn, was the title of a paper by H. A. Terry, read by Secretary.

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BEST SHRUBS FOR THE LAWN.

BY H. A. TERRY.

In writing up a list of best shrubs for the lawn, it is not to be supposed that we will hunt over the latest nursery catalogues for new things, as it should be well known that many of the old varities of our childhood days are really the best shrubs that we have.

The writer of this paper has been growing shrubs for thirty-five years, and during that time, first and last he has learned by experience that many of the varieties of shrubs and plants that are highly recommended in Europe and the eastern portion of the United States do not prove "best" in our prairie region where the mercury in the thermometer sometimes goes down nearly out of sight.

To be best, the plant must be perfectly hardy in the first place, then it must be healthy and a good grower, and if a flowering plant, must possess either or both beauty and fragrance.

Among the old plants or shrubs that are well known to every one in this hall is Lilac family, which possess in a wonderful degree both beauty and fragrance.

When first introduced many years ago, there were only two varieties and colors, the purple and white; but within the last few years many new varieties have been brought out with all the shades of purple, and some of them even running into scarlet and crimson and possessing the most exquisite perfume.

If one wants to make a beautiful clump on the lawn almost any variety of Lilac would be "best."

The Philadelphus or Syringa as it usually called, is another fine shrub that possesses the delightful fragrance of the orange flower.

There are many varieties of this shrub in cultivation, all with white flowers, several of which are semi-double. On the lawn, it would require considerable pruning to keep it in proper shape, but it is easily managed with a little care and a sharp eye.

Nor should we forget the old and popular snowball as a lawn shrub. It is one of the earliest to grow, though like the Syringa it will require a good deal of pruning, as it is rather a straggling grower. By judicious clipping of the wandering shoots, it may be made "a thing of beauty" which is "a joy forever."

The Spirea family has several very valuable members, some of which would be very appropriate for the lawn.

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The following are good growers and free bloomers, and very hardy: Louis Van Houtte, Ulmifolia, Sorbifolia and Prunifolia, all white. Billardii and Callosa are pink varieties in the same family.

Among the newer shrubs is the *Prunus Trilobata*. This is one of the finest hardy shrubs in cultivation.

Most nurserymen now work it on plum stocks, which gives it a fine body, and it forms a beautiful round top which in spring is covered with a profusion of bright rose-colored double flowers, and the ladies say "it is just splendid."

A very appropriate plant for the lawn is a clump of our common garden, asparagus, which has the advantage of requiring no care, except a very rich soil to grow in.

I have been growing a plant in my garden for several years that is so easily managed and so beautiful and showy that I feel inclined to add it to this list of lawn plants—I refer to the *Erianthus ravenue* or hardy pampas grass. This grass grows eight to twelve feet high and in August the stalks are surmounted by plumes ten to eighteen inches in length, of a delicate purplish color that are simply beautiful. This plant starts better and grows stronger and makes finer plumes, with a little winter protection. This is about all the care it requires.

Another one of the newer plants that has not as yet become common on Iowa lawns is *Bocconia cordata*. This plant is herbaceous and grows about six feet high, with long spikes of white flowers that are occasionally tinted with rose. The foliage is grand and beautiful.

Hydrangea paniculata grandiflora—If the name of this fine shrub could be shortened a little it would suit me better, but long or short it is a fine shrub for the lawn, though to do best it should be slightly shaded. It often blooms freely when not over one foot in hight, but often grows to be four to five feet high. This shrub seems to be very hardy; but like many others is better for a slight protection in winter.

In the evergreen family I will mention only one variety that is dwarf enough to be called a shrub and hardy enough for the lawn. That is the Dwarf Juniper or Savin. It grows one to three feet high or rather crawls over the ground, but when properly managed forms a very attractive clump of richest green.

DISCUSSION.

Chas. Patterson: The *Erianthus Ravena* has proved tender the first winter with us, while the *Hydrangea* has been hardy.

N. T. Case: The Savin is not properly considered. As Mr. Terry says it crawls on the ground. I put rocks around it and they kept it up. It did better last year than common. I would like to know if there are two varieties of seowball. Some claim there is a mammoth snowball.

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J. C. Plumb: We have two varieties of *hibernum*, but one is not a snowball.

H. W. Lathrop read a paper on Decline and Death of Orchard Trees as follows:

DECLINE AND DEATH OF ORCHARDS.

BY H. W. LATHROP.

If, in 1804, when Lewis and Clark set out on their expedition across the continent, a horticulturist had accompanied them in search of a spot embracing 55,000 square miles, most fitted for raising the leading fruits of the temperate zone, nowhere between Boston bay and the Pacific shores could an area of that size be found, that promised as much for that purpose as the State of Iowa. Nowhere else between the two oceans could trees be found clothed with a more luxuriant foliage, or loaded with a more plethoric abundance of fruit, or prairies more inviting to the future husbandman. Apples, plums, grapes, cherries and berries grew in all the groves along the streams, and in all the copses scattered over the prairies, and here they had grown for hundreds of years, planted only by the hand of nature, and uncultivated by the hand of man. These wild fruits were growing in a soil unsurpassed in depth, texture and fertility. Had that horticulturist traversed and retraversed this route, his final conclusion would have been, here I will rest; or rather, here I will labor. I will upturn this virgin soil and in its generous bosom I will plant the seeds of the luscious pear, the juicy peach. the spicy apple, the vinous grape and the health-giving berries, so improved by the skill of man and brought to such a high degree of perfection, that they will put to blush these primitive fruits of nature and the lawn shall bloom and bear fruit like a veritable Eden.

We are here to-day; in the footsteps of this imaginary horticulturist, and what progress have we made during the half century we have been at work? We are raising and eating the same plum the dusky daughter of the wild Indian gathered a hundred years ago, and the blackberries we use for dessert are no better than those the wives of Blackhawk and Keokuk spread before liege lords for the evening meal. The pear tree we planted and the peach trees we cultivated are among the things nearly extinct, to us; they are almost prehistoric. The direful omens of bad luck, and the fearful bitter blasts of adversity have swept over our orchards, and we gather our apples from the trees, or rather the barrels of Michigan and western New York.

In improving grapes, however, we have made wonderful progress, for in

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summer we expose the vines to mild Auster's balmy breath, and in winter we hide them from the piercing eyes and chilly blasts of old Boreas, and our genial summer skies give us a quality of fruit unsurpassed by the same varieties in any other locality.

The question that most concerns us is: How and what are our apple orchards?

Elliott, in his Western Fruit Growers' Guide, says: "The duration of the apple when worked and grown on a healthy seedling stock was regarded by Mr. Knight, of celebrity in horticulture, at 200 years, yet trees are recorded as being over 1,000 years old, and in annual, healthy fruiting condition." In what locality these aged trees were grown does not appear, but it must have been where there is a perfect adaptation of soil, climate and tree to each other, and they must have had a wide spread of top, and a large girth of trunk.

The lesson taught us is that here our native apple and plum trees are short-lived. It is difficult for us to find in the place where nature has planted them, a specimen whose trunk is more than a foot in diameter, while forest trees growing beside them are often found that are three to four feet in diameter of trunk, and of a corresponding length of body and spread of top, and whose age is apparently numbered by centuries, nor when we remove these apple and plum trees to our cultivated fields, or raise them in those fields from seed, can we give them greater age or larger size than they have attained in their native groves. From this may we not conclude that the trees we introduce here of the same genus, are to be no longer lived than the natives, and therefore to have a perpetuity of orchards, we must be perpetually planting.

No two countries, no two States and no two localities are just alike in all their surroundings that promote and perpetuate tree growth, and the fruitfulness of trees; hence the conclusion is reached that trees grown from seed in any one locality are best adapted to that locality, especially if the seed planted have been grown there, and that the "survival of the fittest" will determine what is permanently best for that locality.

In my experience and observation I have come to the conclusion that a generation of apple trees here cannot outlive an average generation of men, 33 years, and the conditions must be favorable if the trees equal that in age. While within the boundaries of the State we have 35,000,000 acres of land, less than 29,000,000 are returned by the assessors and included in the census returns. The whole number of farms is 182,225. The number managed by their owners is 137,836, leaving 44,389 managed by tenants. The average size of this farms is 142 acres. The number of apple trees, 4,833,696, which gives us about 26 apple trees to each farm. The amount of apples is 4,118,-591 bushels which is less than one bushel to a tree. These figures are taken from the census of 1885 collated more than three years ago, since which time an almost wholesale destruction has swept over the orchards in the northern three-fourths of the State; what a census taken to-day would reveal is left to vague conjecture, but we may be quite certain that the "dead, wounded and missing" would far out-number the survivors.

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In view of this wholesale destruction, we may well ask, what is best to be done?

One says resort to the Russians, another says raise seedlings, and still another says buy eastern grown apples. Where Russians have proved themselves valuable in hardiness of tree, quality of fruit for culinary and dessert purposes, and in their keeping qualities adapted to all seasons get them if they can be obtained.

But we have 182,000 farmers needing 182,000 orchards of 100 trees each. Let each of these 182,000 farmers next year select from such hardy varieties as Duchess, Whitney, Wealthy, Roman Stem, Tallman, Sweet, Iowa Blush, or any of these hardy Russians one hundred or more seeds, and plant, care for and cultivate them; let this be repeated for at least three years; if in that time one-half of these seeds grow they will have 150 trees each, and as they are all from hardy stock, the trees must be hardy whatever may be the character of the fruit. If, when these trees come into bearing, one or more desirable apples is obtained, use scions from these desirable sorts to top-work the others, and they may all be top-worked to advantage before they are ten years old. If scions of better sorts can be had of brother farmers or from any other source whether those better sorts are foreigners or natives, get scions from them. Now, if one half of these 182,000 farmers will adopt this plan, we will certainly be able to get a few hundred very desirable apples suited to every locality and every season, and that in a very few years.

This may be new work to our farmers, but is plain and simple, and it is not as much work to plant and raise from seed a hundred yearling apple trees as it is to set a hen on a dozen eggs and rear her clutch of chickens till they are a year old, nor will it cost one-half as much.

I wish I could thunder into the ears of every one of these 182,000 farmers the possibilities they have in their hands of supplying themselves in the near future with the choicest of apples. If they would enter into this work in the right spirit the northwest in the no distant future would as far surpass Russia in the production of fruits suited to our climate, as the free, intelligent American citizen of Iowa surpasses the ignorant, unlettered serf of Russia, and the praises of their deeds would be echoed down the flight of time, and be chanted in the chorus of revolving years.

The Russians have all been seedlings in their own country, and the best apples we have in the market have been one day haphazard seedlings, and by intelligent selection of seed, and careful cultivation of the trees, we can avoid at least one-half of the haphazard in production.

If Peter M. Gideon, with only the cherry crab seed, can in Minnesota, produce the Wealthy apple, why cannot we with better seed, produce one of more worth and greater wealth in the generous soil and milder climate of our own beautiful Iowa?

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DISCUSSION.

N. T. Case: The way I manage with my seedlings is this: I plant seeds in nursery rows, and the trees that appear promising I take scions from and graft on top of other trees; to find out as soon as possible what kind of fruit they will produce; and in this way I keep original tree. If fruit is no account I can destroy the seedling; if it is good I have original tree in case accident destroys the trees on which grafts were set.

Col. G. B. Brackett, delegate to American Pomological Society, reported as follows:

REPORT OF DELEGATE TO THE MEETING OF THE AMERICAN POMOLOGICAL SOCIETY.

At the annual meeting of the Iowa State Horticultural Society, held at Charles City last winter, it was voted that a delegate and alternate be elected to attend the meeting of the American Pomological Society, to be held in Boston, September 14th to 16th, 1887, and if deemed advisable a collection of fruits be made and exhibited.

The undersigned was elected delegate and C. L. Watrous alternate.

With feelings of gratitude for the honor of representing the Society at that meeting, your delegate at the proper time commenced in earnest to discharge the duties devolving upon him. The question of making an exhibit of the fruit of our State was fully canvassed, and after communcating with the leading fruit growers of the State it became evident that the severity of the drougth and other causes had so affected the fruit crop that a creditable collection could not be made, and therefore the plan was very reluctantly given up.

On my way to Boston I had the pleasure of falling in company at Kalamazoo with the veteran pomologist, T. T. Lyon, who was also enroute for the same place. We arrived at our destination on the evening of the 13th of September, and on the morning of the 14th we made our way to the Mechanics' Institute building, where we learned that the joint exhibition of the Massachusetts Horticultural Society and the American Pomological Society was to be held.

The first portion of this immense structure was assigned for the display of fruits, flowers, vegetables and plants, while another portion was used for the business sessions of the meeting. On entering the exhibition hall we found the tables already well occupied with fruits and still more arriving.

It was no surprise to us to find that there was scarcely a western State

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making an exhibit of fruits, knowing as we did of the failure of the crop. Arkansas was the only State in the Mississippi valley that made a creditable display, the most remarkable feature of which was sixty-six varieties of native seedling apples, for which the State is becoming noted. Many of the varieties were of large size and of fine quality and appearance. There were also seventy named varieties of apples many of them of marvelous size and beauty.

The collection of pears exhibited by Messrs. Elwanger and Barry, was very fine and well worthy of the first premium, which was awarded to it. Quite an interesting and remarkable exhibit was that of Bartlett Pears from the original tree, the specimens of which were as perfect in form, color and size as any on exhibition.

The many kinds of this fruit grown in Massachusetts, were here exhibited demonstrated that the pear is perfectly at home in this section of country, but to get a better idea of the adaptability of the soil and climate of this locality for pear culture, one should visit the orchards and gardens around Boston and witness the health, vigor and productiveness of the trees. Perhaps one of the most remarkable exhibits in this great collection of fruits, was the display of native grapes made by T. S. Hubbard. The collection consisted of one hundred and sixty-five varities, and was probably the greatest number ever exhibited in this country. It was interesting to note the wonderful progress that has been made in the production of this delicious fruit. In looking over this great number of varieties, we could not find a half dozen that had not been produced within the last tweny-five years and still this long list is being augmented by the addition of new varieties each year.

A few of the new varieties exhibited are worthy of special note. The "Eaton," a black grape of the Labrusca type, supposed to be a seedling of the concord, and for this reason we believe it perfectly adapted to the climate of our State. The leaf is thick covered on under side with yellowish brown down. Bunch very large compact, often double shouldered, berries large, round, black, covered with a blue bloom, pulp tender, juicy, and of better flavor than Concord. "Poughkeepsie, red, resembles the Delaware, but is a better grower, larger cluster and a more perfect grape every way but the leaf being similar to to the Delaware, it will not be likely to succeed only where that variety does.

"Ulster" has all the marks of an iron-clad vine, it is a red grape of fine quality, exceedingly productive the joints, being only about two inches in length. One of the most promising new varieties.

A fine exhibit of shrubs and plants was shown by Jackson Dawson, of the Arnold Arboretum, among which was a remarkable collection of the crab apple family, the fruit being shown on branches of the trees.

TUESDAY, 10 O'CLOCK, A. M. The first session of the meeting of the society was held at 10 o'clock A. M. in a separate room from the exhibition and in the absence of Mr. P. Barry, the first vice president, Mr. P. J. Berkmans of Georgia, was chosen temporary chairman, who after a few well chosen remarks proceeded to appoint the various committees after

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which Dr. H. P. Walcott, president of the Massachusett Horticultural Society, in a very appropriate address of welcome to the members of the American Pomological Society, assured them that every thing would be done for their entertainment and comfort that it was possible to do. He congratulated the society upon the important work it has accomplished and expressed the hope that in addition to the culture of fruits the members would give their attention to the diseases that periodically sweep over the fruit trees of the country.

The Treasurer reported that there was a balance on hand of $5309.00, $5000 of which was bequethed to the Society by the late President Marshall P. Wilder.

Wm. C. Strong announced that a banquet would be given the society by the Massachusetts Horticultural Society on Friday evening and that Mayor O'Brien would furnish a boat for an excursion down the harbor.

A committee of one from each State represented was appointed to nominate officers to be voted for at the afternoon session.

Adjourned to 2 P. M.

2 O'CLOCK P. M.

Report of Committee on Nominations.

Election of officers.

The first paper read was by D. S. Marvin, on Fertilization of the Grape.

Mr. Marvin said in part:

"Grape-vines, like other plants, have been subjected to the changes of natural development caused by seismic catachysms, the various degrees of solar heat, changes of altitude or local environment. These natural causes have recently been much modified by cultivation. One of the marked natural changes has been toward a separation of the sexnal functions. We see this exemplified when we examine the sexnal organs, for no one of the fifteen of twenty species with which we have to deal is now perfectly bisexual in all their varieties. The Delaware is perhaps as perfect in its bisexual organs as any variety. Vineyardists have suffered from this tendency to a differentiation of the sexual functions, but the specialist who originates new seedlings observes it most. Our vines have all been selected with reference to their dual sexual organs and functions; but, notwithstanding all efforts for many generations, seedlings still assert a tendency to a final separation of the sexual functions.

"This brings me to the point that I desire you to consider. We cannot overcome this natural law of differentiation, then why should we continue to work against a law of nature. Would it not be better to co-operate and aid in her line of activities and see if we can not find a better way? My idea is to separate the sexes and aid in developing sexual differentiation by cultivating female, instead of hermaphrodite plants with here and there a male plant elevated upon trees or poles and wires so that the male plants may run above and fill the air with their pollen to fertilize the female plants below. There would result great economy and saving of vital energy that might be turned to the development of more fruit. As it is now the pollen is more or less impotent, failing to fertilize the ovules, and the emasculated

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clusters are many. I have already made some experiments upon these suggested lines of activities, and though the experiments have not gone far enough to determine the question, yet they warrant larger and longer continued experimentation. I have already saved a number of separate sexed vines, and have no doubt of our ability to easily separate a plenty of male and female vines. I have not been able as yet to save an exclusively female vine, but I have male vines, the one chiefly needed at present. True, the ovules are still present, but the upper part or stigma is entirely aborted. These vines develop and scatter upon the air a largely increased amount of prepotent pollen.

Two crops a year, one of pollen in the spring, another of fruit in the fall, each of them containing large amounts of nitrogen, and other costly germ elements exhaust the vital forces of the vine and invite the attacks of sporadic diseases. Whatever former conditions may have prevailed, nature seems to be curing those inherent defects by specializing sexuality to avoid this exhaustion.

The economics subserved will be putting our practices into fuller accord with the tendencies of natural development, wherein the functions of fertilization, ovule development and fruit production will be carried on by the plant in a more natural manner, accommodating sexual tendencies in the direction of a higher order of plants.

The subject has its practical side, even though it may not result in restoring the failing health of the vine. For every one has observed the poverty of the pollen of many of our cultivated varieties, their failure to set a crop of fruit, and the increase of the crop whenever the stigmans have happened to become fertilized with more prepotent pollen from adjoining vines.

I am satisfied that there is no exception in the case of the vine to the discovery of Mr. Darwin that plants really abhor self-fertilization, and that sufficient male vines elevated above the ordinary vineyard would prove a paying investment.

T. T. Lyon of Michigan read a valuable paper on the "yellows" on peach trees, which drew out a good deal of discussion.

A paper by J. J. Thomas of New York ridiculed the high sounding names given to fruits and advocated a simple and concise nomenclature.

THE EVENING SESSION opened at 8 o'clock with a small attendance. W. C. Barry, chairman of the fruit committee, made a report of the work performed by the State committee.

The first paper of the session was "Climate as affecting color in Fruits," by Dr. B. D. Halsted of Ames, and read by the secretary. The essayist claimed that the influence of climate was a secondary importance in the formation of color. It cannot be stated in precise terms why one berry is red and another black. The color of fruit is a development that has been governed by a multitude of circumstances.

Hon. H. E. Van Deman of Washington, D. C., read a paper entitled "The Identification of Fruits," which was followed by one from W. J.

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Beal of Michigan on "Progress in Identifying Varieties of Fruits and Flowers."

President Berkmans announced the committee on awards as follows:

Dr. Hexamar of New York, Dr. Samuel Hape of Georgia and C. L. Watrous of Iowa.

Adjourned to 9:30 A. M.

SECOND DAY—FORENOON SESSION —The first paper read was on "Forest Destruction and Fruit Deterioration," by Mr. George W. Campbell of Ohio. The essayist said our seasons are becoming more variable and the fruit production more uncertain. The peach tree was cited as an illustration of the uncertain character of fruit trees. Forty years ago peaches were grown everywhere in Ohio, but now it is grown only in sheltered places. The destruction of forests was partly responsible for this condition of things. It is an established fact that the winters of Ohio are growing colder and the summers hotter. These climate conditions exercise an important influence in the growth of fruit.

In discussing this paper Mr. A. S. Fuller of New York said that he had observed that the rain-fall averaged about the same in any particular portion of the country. The rain-fall of to-day is not materially different from the rain-fall of forty years ago. But every fruit grower knows that the moisture conditions are greater. How is this accounted for? Simply that the forests have been destroyed, thus giving the winds free play over the unobstructed country. The winds sweep up the moisture that would be left to sustain the trees if the forests had not been destroyed.

Mr. A. L. Hatch followed with a paper upon "The Apple Scab" and Prof. E. S. Goff, of New York, read an essay upon the use of hyperphosphite of soda for destroying the apple scab.

"Promising Wild Fruits" was discussed by Mr. A. S. Fuller, of New York. He said that experience had demonstrated that it was useless to attempt the introduction of any more European fruit trees. Our own are far in advance of the foreign species and instead of importing, the American cultivator should spend his time improving the native forms.

The discussion of this paper drifted into a consideration of whether it was possible to recognize foreign blood in native plants, some taking the ground that it was not; Mr. Fuller, however, claimed that he had no difficulty in making the discrimination adjourned to 2 o'clock, P. M. The afternoon session opened with a paper on "Pests of the Pomologist," by Dr. J. A. Litner, State entomologist of New York. This valuable and interesting paper deserves more than a passing notice. Dr. Litner said: It is a universal law that in every advance made there is a penalty exacted. The development of promology into a science and an important industry has brought with it a great increase of plant diseases and a multiplication of insect pests. To meet their evils, it is necessary to call in the aid of whatever science may do toward their mitigation The best skill of the chemist, the micologist and the entomologist is needed.

Fortunately, our scientific schools, agricultural colleges, the United States

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department of agriculture, and State entomologists are ready to extend their services.

The great increase of plant disease and insect injuries, which the pomologist is now experiencing, is the direct result of the enormously increased production of fruit and the large areas in which fruit crops are massed.

The writer compared the fruits known in his childhood where he knew but one cherry and an orange was a rarity with the freight trains filled with varied fruits now rolling over the continent, destined to find their way to every home in the the land and to foreign shores.

There are no statistics to show the value of the fruit crop of the United States, but it has been estimated at from $200,000,000 to $300,000,000 annually.

The enormous fruit production of our country, resulting from the peculiar adoption of soil to fruit culture, has compelled its cultivation in larger areas than elsewhere in the world An apple orchard at Greenport, New York, covers 300 acres, a peach orchard in Georgia, 790, and Leland Stanford's vineyard in California, 4,000 acres. In what manner the massing of crops promoted insect increase was shown by the speaker in tracing the increase of apple insects from the first introduction of the apple into this country to the more than 200 species of apple insects of the present day; as the result of the facilities of food and multiplication afforded in our extended orchards.

High culture, enormous production, and large acreage have also promoted plant diseases which will only be briefly referred to.

Of the 200 species of fungi known to European writers to infest the grape vine the following may be noticed as inflicting serious injuries in this country: The downy mildew, the powdery mildew, the black rot, and anthracnose. Of the well known plant diseases, may be named the peach yellows, for which no cause or cure has been discovered, the peach leaf curl, the plum rot, the black knot of the plum and cherry, the plum leaf fungus, the apple rust, the pear blight, the gooseberry blight, and the raspberry rust. For the express study of this class of diseases, a section of micology has been established in the department of agriculture at Washington and valuable results are expected from its investigations.

Each year, in consequence of the multiplication of insect pests, the difficulty of growing perfect fruit is becoming greater. The insect can no longer be ignored. He must be recognized, fought and conquered or entire crops must be abandoned to him.

The number of fruit insects is rapidly augmenting. When a new form presents itself to the fruit grower it often proves to be one which had previously lived on some other food plant, but had been led to change to a new one better adapted to its taste and wants. Or it may be an European species brought over to our shores as most of our injurious ones have been, which planting itself in some locality, spread over the country as far as climate and food will admit. And almost without exception having been freed from its European enemies, it becomes far more destructive here than in its old home.

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The number of species of insects is perhaps of almost equal importance with the number of individuals, as each one requires separate study to learn its history, habits, and best means for its control. Of the 325,000 species named and described from the whole world, 25,000 belong to the United States. Of these 15,000 would be regarded as injurious to material, serviceable to man, but only about half of these should be numbered among insect pests, the damage inflicted by some being but slight.

The number of fruit pests cannot be definitely stated. Taking the apple tree insects as a basis of which the present list contains 210, with a probable extension under further observation to 300, it is safe to conclude that there are in the United States at least 1,000 species of fruit issects. Every year is adding to the number.

The speaker decribed the operations of a new currant pest which cut off the tops of the twigs, which had been observed in the vicinity of Albany the present year.

It was not necessarty to urge the importance of attention to insect depredations. Experience had shown its absolute necessity, and certain it was that the most successful pomologist of the future would be he who best informed himself of insects and how to deal with them. It was not expected that he should be a technical entomologist, but he could readily acquire the needed general knowledge of the elements and applications of economical entomology, through the scores of publications issued gratuitously during the last few years by several of the States and the general government.

The following were offered as some of the reasonable requisites of the successful fruit grower:

First. He should be acquainted with all of the more common insects that occur in his vicinity, their names (not necessarily the scientific ones) their injuries and their habits.

Second. He should be able to detect new insect pests, so that he could promptly submit them for scientific study.

Third. He should be able to distinguish between insect foes and insect friends, so that in fighting the former he will not destroy the latter.

Fourth. He should be able to refer then to each one of the several orders to which they may belong, so that he can speak or write of them understandingly, without grouping them all under the name of bugs.

Fifth. He should know the manner of insect feeding, whether by means of biting jaws or with a proboscis, so as to be able to employ the proper class of insecticides.

Sixth. He should experiment with such remedies and preventives as his own observation and experience may suggest.

Seventh. He should avail himself the publications on economic entomology relating to fruit pests, which are numerous and would be of great service.

In conclusion the speaker said that the study of the insect world even apart from its utility, could not fail of being a fascinating adjunct to the pleasurable pursuit of fruit growing.

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The afternoon session closed with an interesting paper entitled "Preventing Deterioration in Small Fruits."

The evening session was opened with a paper "Commercial Fertilizers in Fruit Growing," by P. M. Anger, of Connecticut. The good effect of manure should be two-fold. The first consideration should be the chemical effect upon the structure of the soil, and the second, the inherent value of manure in producing fruit Commercial fertilizers should be used to supplement and not supplant, home manures.

They should be used to a wholesome extent only, and never in excess of an economic application.

The paper drew out a long discussion, the general opinion of the speaker being that fruit growers and nurserymen were deficient in a knowledge of commercial fertilizers and how to use them.

The forenoon session of the third day opened at 9 o'clock. The reports of the various committees were read and approved. The most of the time was spent in the discussion of new fruits.

It was then voted that the next meeting of the Society be held in Florida, time and place being designated by the Executive Committee.

The Society adjourned to meet at Battery Wharf at 2 o'clock P. M. to take the excursion down the harbor.

On reaching the wharf we learned that we were to be taken to Deer Island. It is upon this island that the City of Boston confines its criminal who is convicted of petty offenses and just why the members of the American Pomological Society were to be transported to this place we did not understand, unless it was to give them a wholesome dread of the place by showing them all its worst sights. At 2 o'clock the steamer left its moorings and sailed down the harbor, and leaving us on the island, it steamed away somewhere else for another load of convicts.

But we were treated rather better than the average of those who are taken to the island. We were very courteously shown through all the public buildings, not excepting the six hundred cells used for sleeping apartments, and then we were allowed the freedom of the island to roam where we pleased.

At 5 o'clock, having served out our term, the steamer arrived, and we were allowed to board her and were soon glad to be set free on the main land once more. We were satisfied with the restraining influence which the sights we saw had upon our moral character, and we hope to be better men in the future, and if we ever go to the Hub again we shall try to behave ourselves so as not to be transported to Deer Island.

Once more on shore we soon found our way to the Revere House, where the grand banquet was given. Here all amends were made for our incarceration on the island. After an hour of social intercourse the doors between the parlors and dining hall were thrown open and all were seated at the richly laden tables where feasting and toasting were kept up to a late hour, and after many hands were shaken and adieus said, the banquet ended and guests departed for their homes, feeling that the Bostonians had

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more than sustained their reputation for hospitality, and in knowing how to entertain their invited guests.

All of which is respectfully submitted.

G. B. BRACKETT, *Del.*

D. A. Porterfield: Going back to a subject that has been passed, that I am reminded of by Mr. Lathrop's paper. There is a man selling trees in our county that claims to be propagating 150 varieties of what he calls Thompson's seedlings. A great many of these trees have been sold at one dollar a piece. A great many of Mr. Thompson's seedlings are not worthy of propagation, and surely there are no such number as 150 that are worthy of recommendation, yet the attention these seedlings have received has given opportunity for designing persons to reap a rich harvest and swindle the people.

H. W. Lathrop: I have lived on the prairie a good while, and never was burned out. When we used to fight fire we fought with fire. If we have to fight seedlings, the best way will be to fight with seedlings. In my paper I take the position that we must take hardy seeds from hardy apples. It cost $50,000 to take out a stone that was found to be imperfect in the foundation of this building, and put in hardy stone. We have not got the hardy stock and we must have it. We cannot improve our trees as we do our stock. In stock breeding, there is a greater range than there is in raising trees. I can breed a corn crib in animals, we can also breed the bank barn, the clover field, or we can combine these things in the animals that we can breed. Plants are not as mobile as animals are. I know of nothing that is more susceptible of changes desired, as animal breeding, but with plants it is more uncertain, and when we get anything that is good we should stay by it.

C. L. Watrous: We did not know when we were voting this woman an honorary membership, that we were committing a sin. If parties from Minnesota are selling trees for one dollar, that are only worth twenty cents, we should condemn the fraud, but not the innocent woman that planted the seeds from which the original trees grew.

Geo. VanHouten: I do not understand that Mr. Porterfield or any one else denounces the woman who planted the seeds, of the Thompson seedlings, or the seedlings; but the favorable mention these seedlings have received, has enabled unscrupulous parties to propogate a long list of varieties, called Thompson's seedlings, and sell them at exorbitant prices. While some of these seedlings are

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probably desirable, it is not probable that a large number of them will be desirable, and the fact that parties are selling 150 varieties, as valuable Thompson seedlings, raises strong presumption of fraud on the part of such venders. It is not claimed by Mr. Porterfield or any one else so far as I know, that the Thompsons are parties to this swindle, but we should be careful that the action of this society shall not aid those engaged in the indiscriminate introduction of these seedlings.

President Patten: If the society will pardon me for talking on this subject, and bear with me a few minutes, I will tell what I know of the Thompson seedlings. I was on the ground last summer, and will tell you something as to my conclusions. There are five or six varieties that might be valuable if they had been tested. The wrong is in the Minnesota parties, grafting indiscriminately, and selliing as valuable Thompson seedlings, varieties about which almost nothing is known. The fact that a seedling has grown twenty-five years undisturbed, where the seed was planted, is not evidence that that variety will succeed when grafted and removed from its place of origin. After being grafted they may not follow the apparent hardiness of the original seedling. Some of these seedlings are said to be hardier and more productive than Duchess. But these seedlings showed evidence of having received extra care, while the Duchess showed signs of neglect, and were failing. They, the Duchess, were planted close, and have exhausted the soil; so that the comparison with Duchess, judging from apparent difference in treatment, is not a fair test. There may be seedlings there of great value, and there are probably a few; but no man knows anything about that, and we will not know until they are tested by grafting and general dissemination.

A. G. Williams: These seedlings have been entered as a collection of seedlings, and not as individuals.

President Patten: One, I think, at Dubuque, was entered and received favorable mention.

H. W. Lathrop: On recommended list of Northern District you only have Talman Sweet for winter. Will you kick out promising seedlings when everything of the old list has failed? I will not discuss the sinfulness of sin. We have tried to legislate so that people would not be swindled, but we have not succeeded in protecting them, and we should not be deterred in trying or recommending promising seedlings, just because somebody is trying to swindle the people. Mr. Patten states that some of these varieties have stood

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through all these severe winters and are promising. It is time that we begin picking up our promising seedlings and strays, and give them further trial.

Vice-President Secor was called to the chair.

Papers were read as follows: Future of Orcharding in Southern Iowa, by George Van Houten. Possibilities in Production of New Fruits, by G. B. Brackett; a paper on the same subject, by G. P. Peffer of Pewaukee, Wisconsin, read by the Secretary.

FUTURE OF ORCHARDING IN SOUTHERN IOWA.

BY GEO. VAN HOUTEN.

In presenting my views as to what we should do, and what will be the result of orcharding in Soutern Iowa, I wish it understood that I make no pretense of being a prophet, but will state my conclusions from experience and observation. Neither shall I attempt to picture an *ideal* orchard, or even to give a plan that I should *desire* to follow; but rather I shall attempt to show how orcharding can be made profitable; not only in supplying the home with fruits, but in a commercial sense as well. Climatology, and especially the changes of seasons, and probabilities as to the future, being somewhat speculative, I shall refer to but briefly, although I believe that the past few years have presented more changes and extremes in the way of drouth and cold than is likely to fall to our lot again in the same length of time. The fact that many orchards in southwestern Iowa have passed through these extremes; and that individual trees and varieties, in almost all localities, have endured these extremes, shows that under favorable conditions trees will succeed. I do not believe that we have been as careful to observe these extremes as we should have been. We have, for example, supposed that Yellow Bellflower and some other tardy bearing varieties have escaped damage because of *not* bearing, while Jonathan, Ben Davis and other varieties that bear young, have, as we believe, been exhausted by early bearing; and for that reason we suppose they succumb to the severities of the weather. This may be true, and I believe in part is true, but will not account for all the damage to our orchards.

Many of the early orchards set out are still alive, and limbs interlocking, and the owners advise setting trees farther apart. I know one old orchard with trees nearly all alive, planted 16x16 feet. This orchard has been very profitable for about twenty years, and yet the owner advises people to plant twice as far apart each way—making only one fourth as many trees to the

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acre. This orchard is but an example of many I know, and the owner is like nearly all the rest; for they all advise distant planting. Some of them say set 40x40 feet, and as a defense of the plan say that their apples are not as nice as they would have been if trees stood farther apart. They forget that they can cut out three-fourths of their trees, and then have them the required distance. The trees to be cut out are thrifty and have borne from ten to one hundred bushels per tree, and it looks like a destructive thing to do. Now why are these closely planted orchards in better than the average condition? My answer is that they have been under more favorable conditions. Why, as a rule, are the trees in the west and south side of unprotected orchards in worse condition than elsewhere in orchard of same varieties? My opinion is, that trees need protection from south and west.

I give it as my opinion that sun-scald is the greatest enemy of successful orcharding in southern Iowa. The Wealthy can endure the severest cold we have ever known in our quarter of the State; but often fails by sun-scald. The natural inclination of the Wealthy is to make long stems, and it is difficult to get limbs low enough on a Wealthy tree to protect the body; and in fact it is difficult to do this with any variety for several years, and with some it is never possible. The advice so often given to head low does not generally accomplish the result until after the damage is done.

I am aware that some may say why not select varieties that will not sun-scald! We might answer why have we not on our fruit lists such varieties? In the first place the list of desirable varieties that will not sun-scald in southern Iowa is a very short one indeed, and they are almost exclusively in summer list. So the only way we can do, is to either get *new* varieties that will not be thus affected or protect those we have. But how shall we protect them? is the important question! My plan is not only cheap but highly profitable.

Prepare orchard ground in good shape, and run out straight deep furrows toward half-past 1 o'clock sun. Rows twenty-eight feet apart; set trees ten feet apart in these rows, leaning in direction rows run at an angle of ten to fifteen or twenty degrees owing to variety. Plant corn in the rows, and six rows of corn between each two rows of trees; cultivate well, so as to get good growth of trees and stalks, leave corn standing in row of trees, and if balance is cut for fodder, leave in field until wanted for feed—mice and rabbits like corn better than bark. Continue planting corn for several years, and hoeing out if necessary to get corn to grow in rows, until tops of trees shade the bodies of trees north of them.

Give thorough cultivation and induce rank growth early in the season. As soon as trees begin to bear, or get to be of bearing size, seed to clover and after clover is well set, the trees will not be injured by pasturing to hogs and calves in spring and early summer. Later pasturing will not hurt the trees, but the clover must be allowed to seed or it will not be permanent.

If pastured to hogs alone, they are liable to eat out in spots, leaving other places untouched. My practice is to take calves out of orchard about the first of July, or as soon as they begin to feed on the fruit. The hogs can be

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left longer, but should be taken out when trees droop with weight of fruit so the hogs can reach more than it is desired that they should have.

It may be asked, have I tried the close planting here recommended. I have; and so long as it was only a theory with me, I allowed myself to be ridiculed out of advocating it as a principle in orchard management; but I now give it as my belief, and am willing it shall go on record, that even such varities as Rambo, Lowell, Maiden Blush, Jonathan and Ben Davis, can be successfully and profitably grown in Southern Iowa if set as above indicated. The rows can be set far enough apart to give color and quality to the fruit, and the thinning out should be done in such a manner as to have bodies of trees shaded during hottest part of the day.

If it is desired varieties can be alternated in the row. For Tetofsky, Duchess, Whitney, and other upright growers, set one short-lived tree—as Ben Davis for example, for a nurse. Some may ridicule the idea of nursing Duchess, which is our standard for hardiness, with the tender Ben Davis, but even the Duchess is liable to sun-scald; besides, the Duchess will thrive and bear for several years, at the distance indicated, and the nurse trees will pay for the whole orchard before they are removed; and those remaining will be in much better condition than if they had been planted 20x28 feet at first.

With spreading varieties, like Janet and Winesap, two nurse trees can be set between; cutting out one on north side of permanent tree first; leaving one on the south until the next permanent tree, or its own limbs, will break the effects of the sun. As damage is done when sun is far to the south, the next permanent tree as a rule, will shade the trunk before its own limbs can be made to do it.

If it is thought that twenty-eight feet is too close for rows, set 36 feet, but do not set farther in row than ten feet. At this distance the permanent orchard will be 30x36 feet, and it will be many years before they require all the nurse trees to be removed.

I recommend Ben Davis for nurse trees, because they grow vigorously and in good shape; they bear young and profitably; they sell well because they ship well. They can be bought at twenty to forty dollars by the thousand at two years old, and very seldom die until they have borne several profitable crops.

I would head trees low and prune but little, expecting to get my profits in first 15 or 20 years.

Then to briefly sum up the essentials of the future orchard of Southern Iowa:

First. Set rows so as to shade trunks of trees from 11 until 3 o'clock, by setting rows toward 1:30 o'clock sun.

Second. Lean trees in direction sows run.

Third. Set trees very close in the row, to be thinned when over-crowded, so as to keep trunks of remaining trees shaded.

If these three essentials are observed, in addition to ordinary good orchard management, success will follow; and I believe the future most successful orchards of Southern Iowa will be made on this plan.

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POSSIBILITIES IN THE PRODUCTION OF NEW FRUITS.

BY G. B. BRACKETT.

The subject of this paper may seem to some to be of an entirely speculative nature. But if we accept of the theory of evolution, and especially of the three great laws which Darwin lays down of variation, heredity and survival of the fittest, we have a basis on which to found our most sanguine hopes of success in the production of new fruits adapted to almost any condition of climate or soil.

Darwin's theory of the origin of the species and the survival of the fittest offers to the horticulturist a problem the solving of which is full of great promise.

Starting out with the idea that all the present forms of life have come up from the lower, and are the result of modifying influences brought about by the action of physical conditions through successive generations, we are enabled and encouraged to look forward to the achievement of grander results than the most sanguine mind has dreamed of.

It is not within the scope of this paper to describe definitely just what the fruits of twenty-five, fifty or one hundred years hence may be, but simply call attention to a few facts and let each one draw their own conclusions as to what may reasonably be expected.

It is a familiar fact to the student of nature that in all plant life as well as animal, there is a tendency to variation. The kernals of corn on an ear vary from each other and from the parent kernal. The seeds of an apple may produce as many varieties as there are seeds in it. But in spite of this variability there is a tendency on the part of each individual to transmit its peculiarities to its offspring. Now, between these two contending forces, the great process of development or evolution goes on. And as species multiply so rapidly multitudes of living things must die out. And again we find another wise provision of nature whereby the weakest and less favored forms have to give way to the stronger and best suited to withstand the adverse influences of the surrounding conditions. In a state of nature, unaided by man, these processes of development are carried on slowly; but by the application of scientific knowledge, by artificial fertilization and selection of the fittest, a much shorter time will be necessary for obtaining new varieties possessing all the desirable qualities which are needed for their environment. Man's power of accumulative selection is the key to the origin of our diverse breeds of domesticated animals and cultivated plants,

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and it is through this influence that plants become acclimated and improved. Thus we may see through this ever restless nature of matter the change going on and upward for the improvement of the fruits and flowers, and that it is impossible to fix the boundary of possibilities in the production of new fruits.

By what has already been said in reference to the laws of nature governing plant life, we are enabled to give some idea of the possibilities in the production of new fruits. But let us look at the subject from another standpoint. Let us turn our attention briefly to the past, and see what progress and improvement have been made in our small fruits, and, judging from the past, may we not hope for still greater progress in the future? Take, for instance, the strawberry. Many of us can remember the time when we had but the small Early Scarlet, the Neck Pine and Hovey's Seedling. And then came the wonderful Wilson, which was a great advance in improvement, and from this time on new varieties began to multiply rapidly, until now we have an almost endless list of this most luscious fruit. The Crescent, Downing, Sharpless, Miner, Jewell, and nearly the whole list of valuable varieties, have made their appearance within the last ten or fifteen years. The Crescent was first offered to the public in 1876, and, after being tried under varied conditions, the universal opinion has prevailed that it was the best variety, all things considered, yet produced, but the climax was not reached in this berry. The Jessie now comes to the front with a most wonderful reputation, which, if established after thorough trial, will surpass all other strawberries.

Then let us take the history of the grape in this country. Up to 1840, the only grapes grown in open air were the Catawba and Isabella, and these were confined almost wholly to the bluffs about Cincinnati. The Ives and Iona came later, and then Mr. Rogers commenced his work of crossing the foreign grape on the Wild Fox grape of Massachusetts, the result of which was the production of over forty new varieties, some of which are still esteemed very highly. Soon after this Mr. Ricketts began his experiments of hybridizing or crossing, in which he was successful in producing many valuable varieties. From about this time on, the interest in such work began to deepen, and scores of experimenters have been busy multiplying varieties until we now have a long list of valuable sorts of this excellent fruit. For instance, Mr. T. S. Hubbard exhibited one hundred and sixty-eight varieties at the late meeting of the American Pomological Society held at Boston. And still the work goes on. New varieties were there shown of excellent quality which have not yet been placed on the market.

It will be noticed that the line of work that has been carried on has been in the direction in which the quickest results could be obtained, viz., with the small fruits. But if the same persistent effort is made (with a little patience added) for the improvement of the large fruits, the results will be the same and the experimenter just as surely rewarded.

I have called your attention to but a few of the many instances which might be cited to show what improvements have been made in the past, but deem them sufficient to establish the principle of evolution, progress and

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development, and by judging from the marvelous results which have been accomplished in the past we may form some idea of the possibilities of the future.

The question may be asked: Are there no limit to the production of new fruits? To which we say no; not so long as the laws that now govern the universe are in force; no more than there can be to the variation of individuals of the human race. New combinations may be formed indefinitely as long as time shall last.

Now, if the above premises are well founded what a vast field of labor is open for the enthusiastic experimenter. The coming race of apples for the great northwest must be originated mainly through seedling production, selection, and acclimation upon the soil and under the climate of this section of country.

You may hunt this wide world over for a list of apples perfectly adapted to this section of country, but it cannot be found. For there are no two sections of country on the earth which are identically the same in soil and climate, and however slight the change of the conditions, there will be a corresponding change in the results. A few varieties may be found here and there suited to our wants, but for a perfect list that will give us apples throughout the entire year, we must look for it through the line already marked out. Mr. A. S. Fuller, of New York, said at the late meeting of the American Pomological Society, that experience had demonstrated that it was useless to attempt the introduction of any more European fruit trees. Our own are far in aduance of the foreign species, and instead of importing, the American cultivator should spend his time improving the native forms.

To the young horticulturist there is nothing in which he can engage that is so full of promise or offers greater reward as this field of labor, the production of new fruits.

PEWAUKEE, WIS., Jan. 9, 1888.

Secretary of Iowa State Horticultural Society:

MY DEAR SIR—Yours of 26th December came to hand, and in answer to your kind invitation to attend your meetings, I thank you; but I cannot attend, as I am going to attend the American Horticultural Society meeting in California, and have to leave here this P. M. or to-morrow morning, in order to start with the horticulturists' excursion from Kansas City on the 12th inst. In regard to cross-breeding varieties, our experience teaches us that it is easily done, and with the best results, when the flowers are just commencing to open their petals. If on apples or pears, we remove all the blossom buds but one or two from the cluster that start from the one flower bud, on a cane or limb that we can easily cover with a small paper sack or any other material that will cover the flower and keep insects and pollen from other flowers out. Those we want to work on, we open the petals with a pen knife with the left hand, and with a small pair of scissors in the right hand cut and remove the pollen. When that is done cover the flowers and get other pollen from the variety wanted, or an open ripe flower from

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the variety you want to improve the variety the pollen has been removed from and put in the bag or sack and cover again. If well done, so no other pollen can fertilize it, and the sack removed in 24 or 36 hours, the fruit will set, and the seed from that fruit saved and planted, is to grow the tree that bears the improved variety. The hardiest variety in the tree is wanted for the female, and size and color follow it in the fruit. The pollen or male gives quality and flavor, and if of a long-keeping variety, keeping also.

But all this has been thought and wrote about for years, still there are many advocating planting trees together in groups, and let nature do the fertilizing. That is well enough if you plant 100 or 1,000 acres in a seedling orchard. You may get some good varieties, but it takes too long to pick them out. Now, most all pollenized apples will have from five to fifteen seeds, and in fifteen or twenty minutes about so many dozen flowers can be operated on, and the seeds saved from them will make quite an orchard, if they should all grow, and there is no more risk in raising such trees and variety of fruit than there is in crossing livestock. You can judge very near what you will get in the offspring of the two varieties used for such a purpose; only be particular and do it well.

If I had the time to spare, I would describe some of my new sorts fruited the first and second time this last summer; also, what work we had to cross the wild native, only one now that is bearing, but the fruit is not much improved in quality, only the size and color and the growth of the tree is better, and now the pollen of other varieties will or can be more readily crossed on it, We fruited for the first time a double cross from the Siberian sorts; the apple is nearly the full size of Maiden Blush, small core and seeds, and sprightliness of the crab are still there yet.

Hope this will give thought and discussions on this subject, especially on selecting the variety to be used for the female, etc. Yours, etc.,

G. P. PEFFER.

J. C. Plumb: I do not think that Mr. Peffer has been fully satisfied with the results of his work in cross breeding. He expected to get from the mother side, form and size, and on male side quality; and he experimented on this line. Following out this line of experiment, he has produced a large number of varieties. I have watched them carefully, and, if I had been doing the work would be discouraged with the result. Some of his later work may do better. I think Mr. Gideon will get better results from cross breeding, as he is working I think on the right line. Mr. Gideon said to me that he was going to work on both lines. In expectation of getting quality from the mother plant, he was going to send to Missouri or southern Iowa and get some good apple-grower to make the crosses for him. He would send the pollen from his crabs, and from this cross he would expect to get good results. He also expects to get pollen from

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points south, to cross on the crab family. It will take time to tell what the outcome will be, but from pollen sent south, as he proposes, I expect good results; but from pollen received from the south to fertilize the crab family, I do not expect good results; as the crab is prepotent and will too strongly mark the produce; but in using pollen from the Siberian family on good varieties growing further south, I do expect satisfactory results.

C. G. Patten: I would like to know why pollen of long keeping varieties, should be expected to make a long keeping variety. Mr. Gideon commenced with Blue Pearmain, Duchess and such other varieties as they had left. Most all of their old varieties had been killed out. He planted thousands of crab seed. He now proposes to take these cross bred varieties and get pollen from the south part of our State to fertilize them. He has already got, in the seedlings he has, the character, or part at least, of such varieties as Blue Pearmain and Utter Red. His No. 5 or Martha is perfectly hardy, and has some points of excellence. Now if we cross apples of good quality on this, we *should* get apples of good quality and hardy trees. The advantages, as I have before shown, that an apple of fair quality can be produced from a crab, has not received proper consideration. We have neglected the planting of apple seed. Mr. Plumb says he does not expect definite good results from planting crab seed, neither do I. The Duchess is in a manner, a thoroughbred, and we would naturally expect when crossed with other varieties the seedlings would be hardy; but the rule is that the seedlings are not as hardy as the Duchess, and some are decidedly tender. Another thing, I think some will be disappointed, and that is in the expectation that *form* and *color* will follow the male parents. There is nothing at all certain about this. We may never get a rule by which we can get definite results, as there are many things entering into the combination that we know little or nothing about.

C. W. Burton: Why should we expect definite results. We find that children of the same parents differ greatly in looks and general characteristics, when we should expect little or no difference or variation. That parents having strongest constitution or vigor, should be expected to more strongly mark its characteristics on the offspring.

H. W. Lathrop: We can illustrate this better with animals than with trees. The offspring of our animals will show more characteristic of one parent than the other, and we can not draw the line, as

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greater force is exerted on one side than on the other, but we cannot tell beforehand which will exert the greater force.

J. C. Plumb: I wish to remind the gentleman (Mr. Lathrop) that he was going to breed the corn crib, the bank barn, and the clover field, in his stock, or that it could be done.

We do not know the forces of the parents, or the forces behind them. That is a matter that must be brought out by experiment.

C. L. Watrous: It resolves itself into this, that we had better experiment first and talk afterward. This discussion reminds me of a parrot and dog story, and it seemed great fun to see the dog looking for something to go for, but the fun changed one day when the parrot got out of its cage, and when he commenced his old game of hissing the dog, and the dog looking all around, saw nothing but the parrot and went for it. After he had mussed up the parrot and pulled out some of its feather, the parrot managed to say git out you rascal, to the dog, and thus drove the dog away. The parrot then looked itself over in a disconsolate way and said, "Polly, you talk too much, you talk too much.

I think that is the way with us sometimes, we talk too much about things we know nothing about.

On motion of C. L. Watrous, paper of Edson Gaylor was referred to committee, for publication in report.

C. L. Watrous moved, that no further papers be read at this meeting, unless the author is present. Carried.

J. C. Plumb: I would like to discuss Mr. Lathrop's paper. I think there are few points in the paper not commented upon. I admire a man that has gone through what he has. He says plant seeds largely of our best varities. He should have said, from trees with best surroundings, and then there would be better prospect of good results. To plant of the best varieties, is just what I did for twenty-five years. In my father's family we were taught to plant the seeds of every good apple. When we ate apples we never thought of throwing the seeds away, and we saved from the household. They were the choicest apples of New York, and we planted in great profusion. But when I look back and think of the work we did, my heart fails me, for we got not a a single valuable variety to reward our effort. If we do what Mr. Lathrop recommends, we will be just simply traveling the road over again. This society should be doing purpose work, and not the aimless haphazard work that such planting would be.

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H. W. Lathrop: I wrote my paper from the rank and file. Vicksburg and Getteysburg were fought by men who never studied military tactics. It is true there were a few generals, but the men who loaded and fired the guns brought down the enemy and won those great battles. I denoted a certain line of work, and urged that it should be undertaken. I do not expect to get one half of the 182,000 farmers of Iowa to undertake this work, or 10,000 or 5,000; but if I can get one in each of 50 counties to work, even if all work at random, there will be a good work accomplished. If we had had a Mrs. Thompson in every county, we would have got something better than they have out there in Grundy county. There will be more systematic work and more work done, and good will result from it.

N. K. Fluke: I think we can get on a plan that will accomplish more than this trusting to voluntary work. We have trial stations over the State. If we could give them seed and let them plant, we could hope for something, but farmers are too busy, and thus are not in position to graft and test new varieties.

Adjourned to meet at 7:30 P. M.

EVENING SESSION—THIRD DAY.

Met pursuant to adjournment.

President Patten announced the remainder of the committee on Constitution and By-Laws (President Patten selected as chairman by the Society) as follows: Geo. Van Houten and John Wragg.

C. A. Mosier read a paper on window gardening as follows:

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WINDOW GARDENING.

BY C. A. MOSIER, DES MOINES.

"The south wind searches for the flowers
Whose frangrance late he bore,
And sighs to find them in the wood
And by the stream no more."

In these beautiful lines Bryant has delicately expressed the feelings of every lover of flowers when, looking out upon the garden, after our first hard killing frosts, he sees his favorite plants and flowers slain, their drooping heads and branches appealing to the destroyer to stay his hand, but all in vain.

The true lover of nature was not long in determining what to do, and long before the term window gardening was invented many a window in the homes of the lowly and poor was turned into a miniature Eden. The rich can have their conservatories and experienced florists to attend to them, but it is within the windows of real lovers of flowers, those who cultivate them personally, treating them as sentient creatures rather than as plants, noting their every want and never forgetting them, that the highest success and greatest happiness are coupled with the culture of flowers.

After the proper preparation of the heart, come other considerations, such as soil, light, heat, moisture, air. Of course you have a window.

SOIL.

Ordinary garden soil is well odapted to the potting of nearly all kinds of window plants. Some plants require a porous soil; sand should be added for these. Roses like a rather sticky clayey soil; not soggy but compact. I have found it best to add about one third in bulk of old cow chips well pounded and sifted. The richer the soil, as a rule, the better the flowers. A Calla will flourish in nothing but the richest preparation. Rich loam from the woods, sandy to excess, suits tuberous rooted begonia best. All rank fertilizers, those that are likely to heat or produce fermentation, must be avoided. The product of the stable must be most thoroughly rotted before using. Bone meal, about 1-30, may be added to the potting material with advantage to all kinds of plants I have experimented with. It is safer

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for the beginner to use rich garden soil, at first, and by reading and practice he will find for himself how to feed this plant and that which will make it flourish best

LIGHT.

Direct sunlight is necessary to the healthy growth of nearly all plants. Begonias may be grown at a north window, but they require heat. Fuchias do well with very little sunshine. English and German Ivies and Coleus, also, will do well in shade.

An east window is the easiest place in which to manage a promiscuous collection of plants. A south window is best, because direct sunlight is necessary to the production of flowers; and the more the better, provided care is taken to avoid too high temperature, or scorching in the middle of the day. A west window is good, but requires careful watching when the sun shines very brightly as on clear warm days. Plants may be arranged so as to grow those that are partial to sunshine in the most exposed situations and the shade loving plants in a protected corner or in the rear of other plants. These things must be studied, and above all looked after daily, to insure healthy growth and flowers.

TEMPERATURE.

It is a difficult thing to keep the temperature of an ordinary living room heated by stove or furnace just right for the growth of plants in a window. The lower shelf will be too cold and the upper too hot. But this difference enables one to keep a somewhat promiscuous collection. Thus the rose and carnation and geranium will do best on the lower shelf because of the lower temperature, while Begonias and Callas and Coleus, etc., like heat, and do best on the upper shelves. I have had an abundance of carnations from plants in pots that I found frequently frozen to the boards, while in bloom. Roses, too, will stand cold quite well, but do best where the temperature at night is never below about forty-five. We all know that the temperature of a green house or other place where plants are grown should be lower at night than in day time. The nearer we imitate nature the better success will attend us. Steam heated and furnace heated rooms are likely to be too hot at night if the firing is kept up; and if neglected, freezing is apt to take place.

To avoid freezing in window, if plants are not removed to a place of safety, place newspapers between the plants and the window panes at night, and remove them in the morning as soon as it may be safe to do so. A box of suitable size kept in the room during the day, lined with newspapers or other non-conducting material, will, if the plants be placed in it at night, protect them from injury where the temperature falls to below freezing point in the room. The box should be closed with a lid.

WATERING.

To water plants properly requires experience, good judgment and nice dis-

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crimination. If too much is given, the earth becomes soggy and sour; the water leaches the strength of the soil out of the pots and from the upper shelves dripping onto the lower plants spoils foliage and flower. At a high temperature I have found watering twice a day necessary, especially pots on upper shelf. Whenever the earth in pot begins to be dry on top so as to crumble between the fingers, water should be supplied; if cool weather or low temperature in doors some plants will stand erect when the earth in pot is baked hard, but the tender growing or working roots always suffer from neglect to supply water at the right ttme, and failure to get flowers often comes from this cause. Water should be at a temperature of about 60, especially in cold weather, for lower shelves, but where temperature is high, it is not injurious to use water as low as 45. Cool water in summer time is advantageous, as it lowers the temperature, which, generally speaking, is desirable. But winter or summer spraying, even with water right from the well, is advantageous. Unless there is great danger from frost this should be done daily, as it keeps the leaves clean and provides a moister atmosphere about the plants, the result of slow evaporation. Morning is the best time to water, if but once a day; especially in winter time, when there is no heat to spare.

If water is showered or sprayed upon begonias and other foliage plants, it should be when the sun will not strike them. Even hardy plants may be injured by neglect of this precaution when the rays of the sun are at their greatest strength.

Very warm water may be poured on the soil in which the calla lily is growing. Even boiling water can be used to good effect if carefully applied; water at 130 to 150 is best. I have frequently dipped small roses in water at the latter temperature to kill aphis, with no evil effects upon the plant; of course it must be but for a second or two at most. Very hot water should not be allowed to touch the leaf stalks or roots of calla (*Richardia*). Where temperature is high, ordinary watering is safest, yet since the calla likes heat it accepts the very hot water gratefully.

AIR.

The highest perfection in window gardening cannot be attained without proper ventilation. Plants as well as animals require a supply of pure air, though they use the elements in quite a different way. Cold draughts are as injurious to plants as to animals. Let clean, pure air into an adjoining room and then admit it gradually into the room where the plants are. This of course refers to zero weather. In ordinary weather ventilation of room in the usual way is sufficient. But even in the very kitchen where all the cooking is done, the expert window gardener will have roses, carnations, begonias, etc., in bloom in midwinter. I have seen this or I would not dare to state it. The vapor from the boiling water seemed to more than recompense for the damage done by burning of hot grease.

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ENEMIES.

Roses, carnations, and some other plants, are always attacked by aphis, which if let alone will sap the vitality of the plants till they are worthless.

The mealy bug finds the axils of the leaves of the fuchsia a genial and luxurious home. Scale insects, repulsive looking brownish spots, sometimes one eighth of an inch in diameter, are found on the calla and some other plants, and if permitted will destroy them. The red spider, so-called, likes the rose, and not unfrequently attacks the ivies and geraniums. Small white worms sometimes infest the soil in the pots; also the common angle worm will multiply when once started till the plants about whose roots they work will droop and die. All these enemies, and others I have not named, will be found in every collection of window plants, sooner or later. The question then arises what to do? Tobacco smoke applied to plants infested with aphis is a sure remedy, and if repeated twice a week will keep the plants free from this pest. Place the plants under a large box, set a vessel containing live coals with tobacco stems and cigar stumps or other refuse tobacco upon them, so as to fill the box with smoke, and leave the plants therein for two hours. Then syringe with tepid water. Another good remedy is whale-oil soap. Dissolve an ounce in a gallon of warm water and syringe plants thoroughly with this suds. In a few minutes syringe with clear tepid water. For roses the soap suds may be used quite hot, even hotter than the hand will bear. Red spider will yield to the same treatment. Be careful to syringe the under side of the leaf as well as the upper. Turn the plants from time to time as the work is being done.

Mealy bug on fuchsia is best removed with a pin; spear him. If the plants are too badly infested, throw them away and get new; you will save time and patience, and your joy will be greater in the end. A decoction of tobacco applied with syringe is good, but if strong enough to kill mealy bug will generally cause plant to cast its foliage.

For the scale insect upon calla, I have found alcohol the best remedy. Moisten a fine sponge with alcohol and touch the leaves and stalks lightly with the sponge, press it upon the scales heavier than upon the rest of the leaf. Follow immediately with a brush, briskly brushing the leaves, holding a paper to catch the scales, that they may be burned, for the alcohol sometimes only causes the insect to release its hold and to lie in that glorious condition supposed to be known only to personal liberty folks.

Soot is recommended as a destroyer of white worms and the ordinary earth-worms. Copperas, a piece the size of a hickory nut, dissolved in one gallon of water, poured on hot as in watering, I have found to be death to the worms without injury to plants.

HOW TO HAVE FLOWERS IN WINTER.

During the early spring and summer is the time to prepare plants for the window that will bloom when ice and snow have covered the earth and the sight of even a green leaf awakens pleasure in our hearts.

Roses, geraniums, carnations, etc., should be potted in as small pots as

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possible to start with and shifted every few weeks to a size larger. The pots, after the middle of June, should be plunged in earth or coal ashes or sand, watered, showered, pots turned frequently to prevent rooting in the earth below, and what is very important, all flower buds should be picked off the plants as soon as they make their appearance. Unless this is done the plant exhausts itself blooming before the winter approaches and ceases to bloom at the very time we want flowers most. This pinching back of carnations should cease about the last of August. It may seem a hard thing to do, to pluck buds from the rose, but it is the only way to have them bloom in winter. Roses should have a period of rest, say the last of August; water should be withheld and even the leaves allowed to drop, but a scant supply of water to prevent shrivelling of bark is necessary. In September water freely and bring into rapid growth again, using liquid manures to stimulate them.

Seeds should be sown of such plants as we wish for the window and to supply the garden in summer. Use shallow boxes and keep in a warm place; transplant as soon as the plants can be handled into larger boxes so as to give room for good healthy development of plants. Primroses for next winter, pansies for early blooming out of doors, Ten Weeks' stock, and such other plants as need an early start.

In autumn, if we have managed the flower garden aright, we can find plenty of good plants for the window to add to those that are specially prepared for indoor culture.

The tuberose, a very desirable plant on account of the fragrance of its florets, can be held back in spring, planted late as June, and before frost in autumn taken up and potted and placed in a warm sunny window, where, if watered freely, they will bloom if possible better than out of doors. I have found them very well adapted to indoor culture.

For a semi-tropical plant the Canna will, if potted, answer every purpose. Its large stalks and beautifully margined leaves make a fine background for other plants of lesser size.

A sweet potato, if planted in a box of sand and placed in a warm, sunny window, will furnish a surprising effect before the holidays. The Maderia Vine is easily grown in a window.

Stevia, a greenhouse plant, can be grown in the window quite successfully, and its white flowers are always in demand.

Browallia, the white and the blue, are excellent winter-blooming plants. Any one can raise this plant from seed. Sow early in box, and when large enough pot. Shifted once or twice they will make fine plants for late fall and early winter blooming, and the blue is beautiful to put in bouquet with the red geraniums or carnations, or even with roses, for contrast. The foliage is fine and useful, as is that of the stevia. Those who really wish to raise flowers in the house will have no trouble in finding many beautiful plants that they can succeed with.

If you wish flowers with little labor or care, and flowers all winter, from the holidays until the early flowers in open ground, pot two or three dozen hyacinths, assorted colors, early in October. Plunge the pots in a trench

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two feet deep, cover the trench with boards, then with a little earth, and as colder weather comes add coarse litter and leaves to the covering so as to keep out frost. In from four to six weeks take a few of the pots into the house, place in a warm, sunny window, and at intervals of two or three weeks bring in until all are started. The first will bloom during the holidays, and a single plant will produce flowers that will fill a whole house with fragrance. As these wither and fade others will bloom, and until the bulbous plants in the open ground are in full bloom you will have a constant supply of flowers in the window that may be carried to any part of the house where the temperature is above freezing, and flowers whose fragrance is a grateful reminder of the springtime past and to come.

"Make your home beautiful, sure 'tis a duty;
Call up your little ones, teach them to walk
Hand in hand with the Angel of Beauty,
Encourage their spirits with nature to talk.

"Make your home beautiful; weave 'round its portal
Wreaths of the jessamine and delicate sprays
Of red-fruited woodbine, with gay immortelle
That blesses and brightens wherever it strays.

"Gather the blossoms, too—one little flower,
Varied verbena or sweet mignonette,
Still may bring bloom to your desolate bower,
Still may be something to love and to pet."

J. C. Plumb: I love to hear such papers. They are profitable. The paper is a practical illustration of what can be done. The ennobling influence of such papers is hard to estimate high enough. We have the credit of introducing this class of papers in Wisconsin. We make it a point to get papers on such topics from our lady members, especially at our summer meetings, when we are away from the shadow of the capitol. Some will only know of you and your work by this class of papers. During the Centennial Exhibition I went to Mission Sunday school and church in Philadelphia, and was struck with the appearance of some of the houses. Some five story tenement houses, in every window and at every door there were boxes of flowers. When that Mission Sunday school was started, it was in one of the bad neighborhoods of Philadelphia. They gave away flowers at first to the children. These houses are tenement houses still, but the appearance of the houses and the people are very much changed.

Mrs. Mary Cherry Hand read the following paper:

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MISSION OF FLOWERS.

BY MRS. MARY CHERRY HAND.

The great thought of creation, that filled immensity, that occupied all space, that made everything that was made, and without which nothing was made, that was made, and reviewed the work and saw that it was good—The thought so comprehensive that in it all things could live and move and have their being: All planets revolve—all the worlds held as a drop of the boundless love that prompted it: Sustaining the atoms and fluids of which they were composed, in the calm power of thought which called them from chaos; the thought that reflected itself in the myriad forms of life, and stamped them with the seal of love, the great thought that that gave every good and perfect gift—the thought which first expressed itself in life and light, then in love and beauty and last in truth and power—that thought which could not only create but sustain, is supreme. The thought which could think all things, is all things, for all things are in thought. The great Thinker, the great Causation of all things real, from the tiniest form of life to the crowning reflection, which is recognized as man, display sthis perfection of thought, and embodies in each omnipotent truth and omnipresent love. God is the great denominator of thought and man the enumerator, showing how many parts were taken. Each form of life shows the fractional value received. Thought is endless and boundless in expression and is never outlined except in material. Habitation is not matter but in mind. We live in mind, in thought, we have our being in thought, we work in thought, live in thought, enjoy in thought, suffer in thought.

The great Thinker, created in thought every plant and herb of the field before it was planted in the earth. And we, the counterfeiters of this thought, think all things, before they are expressed in material, and in our frail wisdom hope to pass them for the seal, and look to have them redeemed. Says Sir William Temple: God be thanked, man's pride is greater than his ignorance and what he wants in knowledge he supplies in sufficiency. When he has looked about him as far as he can, he concludes there is no more to be seen. When he is at the end of his line, he is at the bottom of the ocean, when he has shot his best, he is sure none ever did or ever can shoot better or beyond—his own reason he holds to be the certain measure of truth, his own knowledge, of what is possible in nature.

We have worlds and systems of worlds of thought, with their suns to give light by day and their moons by night.

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And we, in imitation, sustain our planetary creation, with each thought in its own orbit. We have fixed stars of thought in our firmament, and we have stars that twinkle in their own good time; we have Pleiades of thoughts that cluster in a clear blue sky, and we have the myriads that show the path of Juno; we have thoughts of stars that trace the dragon, and clasp the belt of Onion. And in imitation of our pattern Thinker, we hold them in position, but we do not call the force centripetal, centrifugal or gravitation.

Mind, omnipotent mind, upholds all its creation, furnishes sight and heat and defies the power of human mind to comprehend its vastness and its all-sufficiency.

The necessities of human life are surrounded by, sandwiched between, and overspread with beauty, which, next to sublimity, affords the highest pleasure to the imagination. The emotion which it raises is very distinguishable from that of sublimity; it is a calmer, gentler, and more soothing kind, admits of longer continuance and extends to a greater variety of objects. The divine thought of flowers was next in order after light, and was recorded on the third day of creation. As love is the highest attribute of God and comprehends, interprets and includes all divine perfection; so the flower holds the perfect thought of endless good, limitless enjoyment, necessity and satisfaction.

As the cadence and rhythm of the human language, must be arranged to agreeably meet the material sense of hearing in order to present itself to the understanding; so our Creator has not spoken to us in tedious, monosyllabic objects, but has adjusted the solids, fluids, utilities, grandeur and beauties to avoid all friction of comprehension.

Electricity is the highest counterfeit of thought and possesses the least expression in mankind. Flowers are next, and while their power of development and tenacity varies as much as the power of man in expressing truth; that flowers are the highest type of material expression is conclusive in many ways. The first consciousness of the flower-bud to our material sight is the earliest expression of the thought of reproduction in the plant, and holds within its silent grasp the mystery of material creation. The thought that precedes the bud (not the professor) for limitless thought no professor, is with God and will be reserved for our consciousness of spiritual sight. Tennyson says: "Little flower, if I could but understand what you are, root and all and all in all, I should know what God and man is."

Color and odor is the flowers consciousness of silent communion with heat and light, and is varied and tempered by its contact with material food, and, not withstanding the beauty and richness of coloring it cannot be secured for purposes of dying or painting. The perfume only being subject to captivity and transfer, and to little or no purpose are flowers edible or medicinal, proving their supremicy in the realm of thought, where exists all real power and beauty. As there is no action without thought, so there is no creation where there is absence of light. Light symbolizes life, darkness speaks decay. The spirit of truth reveals all truth. Error is the blind leader of the blind.

The flower is not only possessor of the thought of reproduction, but is used

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to symbolize every thought. As all life is in God, and therefore everlasting, so, at some time, in some corner of every human heart, however hidden and cobwebbed by groping in darkness and evil, the life that is real and everlasting will throb and pulsate to the consciousness of its worth; it will and does seek the symbol of the perfect thought of creation. And so, from earliest historic records, the flower has been the type of everything interesting, public as well as private, of individuals as well as nations.

Florigoaphy was very highly cultivated and used by the Greeks and by all the nations of continental Europe, till after the decline of the power of Rome. It was revived in the middle ages, and was the companion of its chivalry. It became so prominent and received such development at the hands of the Romish Church, that the variety of flowers that adorned the altar enabled the worshipers to distinguish between feasting and fasting ceremonies. Flowers had an important part in all sibylim record and mythologies. Oak was the patriot's crown, bay the poets, myrtle the crown for beauty, and ivy the emble of Bacchus; the olive the token of peace, and the amaranth typifying immortality. Fleur-de-lis the chosen emblem of France. The thistle of Scotland, and the shamrock of Ireland.

Shakespeare has tenderly confided to us that "fairies use flowers for their characters'" While poets speak their thoughts of life, of love, of sorrow and of wealth in flowers, and then declare that flowers themselves do speak —The youth who dare not, or perchance *cannot sing* or say of the gallantry that stirs within, can climb the back fence of a Sunday afternoon and silently express himself in a round, carefully packed ball of Sweet-Williams, and the understanding will be so complete, that no vocal utterance can add to its meaning, showing conclusively that speech is spiritual or nearly so. And when they have learned the alphabet of love through the apple blossom, white violet, honey-suckle, heliotrope, forget-me-not, to orange blossom, to the uttered "yes" which will usher in the realities of the material, one would suppose they had proved the "mission of flowers," but not yet.

The little rude home in the far west, away from tree or mountain shelter, must have its morning-glory at the window and its pansy at the door, to tell the sweet tale of other days, and make life without human friends endurable. Women and flowers are inseparable. The fabulous wonders of the hanging gardens of Babylon were devised by Nebuchadnezzar to cheer the dreariness of the Babylonian plain in imitation of the romantic scenery and flowers of the native land of his Median Queen.

Flowers have always been used to testify the highest, purest thoughts and desires of mankind. The sentiments which could find no companionship in the grosser material has sought the flower, when words dare not be trusted to express sympathy in times of sorrow. The sacrifice of choicest flowers will arrest the belief of death with the cheering thoughts of life. The joy unspeakable at human birth finds utterance in flowers and in a wreath on the latch proclaims to the busy world that in the midst of death there is life.

History records only one instance where flowers have been used in warfare, and in the thirty years of devastating "War of the Roses"—which is still the war of horticulturists—that chosen emblem of love, held aloft, and

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still speaks to the passing centuries the shame of family feud and pride of personality.

In Plato's description of the magical government and cultivation of the Island of Atlantis, flowers were the especial thoughts of the gods, and the distilling of their perfumes thrived as an industry.

In the historic Peru where its primitive people reared a golden temple to the worship of the sun, flowers were their companions, and horticulture their employment, and peace and plenty their inheritance, till the coming of the materialistic Spaniard.

The Toltecs of Mexico luxuriated in floating gardens of shrubs, vegetables and flowers, and expressed not only their joy at marriage ceremonials, feasts and gatherings of mirth and jollity with crowns and wreaths of flowers, but acknowledged all political emolument or sucess by compliments of rare flowers promptly sent, which beautiful custom has been replaced by the politicians of to-day with the glass and the cigar.

The blush found on the flower bud is not for guilt of having distilled spirituous beverages, but for the consciousness of its departure from the spiritual creation enough, to even require the leaf to cover its nakedness.

Arcadian tales are of the mystic companionship and fellowship flowers have with the gods—the aroma of which they can bring to man, if he be in an attitude to receive.

What would signify the spring-time without the plum, the violets and the apple blossom proclaiming the abundance of life in the very presence of seeming death—calling the insect world from their winter's lent to the resurrection feast—wooing with the sweet breath of Divinity upon their lips and the sweeter thought and promise of perfection in their hearts that by their fruits ye shall know them; while man goes "a wooing" with a borrowed distillation of whisky, tobacco and cardium buds, and reaps the sorrow and inheritance which such wooing brings.

Flowers are used to administer not only to the sentiment of the soul, but to the sordid accumulation of dollars and cents. The "Mission of Flowers" as models in the fine arts, to the painter, the sculpturer, the embroiderer, lace manufacturer, in all its varieties, in tapestries, textile fabrics of all descriptions, and the manufacture of *artificial flowers* furnish an incomprehensible industry, providing both pleasure and profit and employing countless hands and wealth.

Flowers are not summer friend only, but from the crocus to hyacinth, to the plum blossom, the violets, the apple blossom, to the aster and chrysanthemum, with their succession of seeds, fruits and bulbs, to the fuchsia, geranium and heliotrope, taken into our windows, like the spirit of truth taken into our hearts, "cheer the winter of our discontent," and breathe the hydrogen we fear and give us the oxogyn we love, giving the very breath of the knowledge of truth which we had lost sight of.

The planet on which we believe we live and move and take our daily journey and our yearly whirl, the thought of which, the movement of which cannot be added to or taken from, by all the material excavations and deposits, which the human mind can conceive of or accomplish, proves to us

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that power is not in matter, but in mind; that life is God, and that all His manifestations are reflection on Him.

Flowers are the thought of God, personated by the human mind, into bearing the burden of many petals or much fruit. The human mind by its own thought in materiality, compeling the flower into color, size, texture, and into time, itself; but the spirit, the life of the flower, is beyond the reach of mortal thought.

Those flowers having the highest significance in thought have least capacity for material development or creation.

When the thought of florists have been attuned to the daintiest touch of life, the reproductive qualities have been dwarfed in the material, showing that spirit and matter have not parallel growth. The blossom of cereals losing almost the expressions of spirit, in their overabundance of matter. The fruit on your tables is the result of the consciousness of matter in the flower.

The "mission of flowers" in the silent "history of the rocks," where they were laid to rest by the ages past, and in sepulchered stillness thrill us with the sense of the power that preserved the jointed stems, a living plant of starry gems—

> "The sea flower, light and fair—
> Which shoots its leaves in agate, there."

The "mission of flowers is even suggested in the dying agonies of the conventional "boquet" *d hotel and d pensionnat*, with its blanched feet distressingly visible in the feted water of the vase, and pleading the humanity which all life demands.

The "mission of flowers" includes the murder of flowers. The Abels are killed by the Cains, the Christ by the Pilate, the Prince of Orange by the friend he sought to bless, the Lincoln by the traitor, the flower by its lover. Spirituality sacrificed to materiality.

To be without flowers we should find ourselves without fruits, without bread, without meat, without wood, without coal, without clothes, without material bodies—and without the "State Horticultural Society." This would reduce us to our time creations which is spiritual. Could the annihilation of the flowers be accomplished, the earth would be devastated and depopulated. If this be the flower which to-day is, and to-morrow is cut down and cast into the oven; what is the capacity and capability of the *real* flower in the thought of the creative mind.

He that has an ear to hear let him hear. Hearing is in *mind*.

> "How good the God of all is found,
> His handiwork how vast, how kind,
> How prearranged, by clearest mind,
> How glorious in His own estate,
> And in his smallest works how great."

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His thought is like an atmosphere,
His love, as boundless as the sky,
His truth, is never here, nor there,
For truth is God, and ever nigh.

Flowers are love's, divine expression,
Mirrors, for the thoughts of man,
Nectar cups, for souls' collation,
Steps—eternity to span.

C. W. Burton: I was thinking when listening to Mrs. Hand reading the paper, that it was such a paper as I should value in the report when published.

H. W. Lathrop: I do not know who got up the program, but who ever did it, followed an old rule of keeping the best wine until the last.

G. B. Brackett: I do not know what to say in approval of the paper. I was in Chicago and came here to this meeting, and I consider this one paper has paid me for coming here.

On motion of Col. Brackett a vote of thanks, and honorary life membership were tendered Mrs. Hand for the paper.

N. K. Fluke read a paper "Helps and Hindrances in Fruit Growing," as follows:

HELPS AND HINDERENCES IN FRUIT GROWING.

BY N. K. FLUKE.

The subject assigned me is a very broad one, indeed it covers and might include almost the work of our society. I will modify it by saying "some" of the helps and hinderences and will take the apple for the subject of this paper, as it is the most important and valuable of our fruits, and one that has almost slipped away from us.

There will be little need of rehearsing before the members of this society, who have gone through all of the difficulties and trials; the need of constant care and watchfulness in cultivating and growing until bearing age "the family or commercial orchard." With what tender solicitude you would hesitate in severing a small twig or limb, which you thought necessary for the usefulness and well being of the tree, little thinking of the cruel

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wantonous and destruction that was so soon to overtake the object of your care. That of which we once might have looked at with pride (because of its apparent beauty) is a complete wreck, with an occasional crippled, or still useful member standing here and there to mark the place our hopes are buried.

But we will not dispair, all is not gone. Seasons may be as they were before, and we may not have such extremes again in a life time. If it is preferable not to risk it, we still have a few well tried varieties that we can safely plant on their own roots.

Another plank we have that we can throw over the stream of our difficulties that will bridge the chasm, till we can grow those "*to the manor born.*"

I refer to double working on suitable stocks. Virginia, Whitney's and Shields' crabs and possibly some of the Russians. I name Virginia first as it has proven more satisfactory with me than anything else tried, there may be others equally good. You will please pardon me, if I speak of some experiments of mine, to better show its character as a stock.

Sixteen years ago I planted out forty root-grafted, Virginia crab trees in the orchard. The next year I worked them to Golden Russet, Pennock and Stark. Three years after I set in orchard twenty Chenango strawberry trees topworked on the Virginia and ten on a seedling that originated in our county, which I thought was hardy and would make a good stock; those on the seedling are all gone, while all of those worked on the Virginia (except one Stark and one Strawberry which were sun-scalded by leaning over) are to all appearance in good health and have not missed a crop of apples since coming into bearing.

Four years ago last spring I commenced topworking in earnest, and have been putting in a number of our old varieties on it, Jonathan, Maiden Blush, Rome Beauty, Grimes Golden, Roman Stem, Baldwin and others, all of which are doing as well as one could wish.

On this stock, "Virginia," all of our old varieties thus far tried make a good union, and will accommodate itself to a fast or slow grower, does not make a granular growth at point of union so common to the Siberian and our native crabs. The Soulard worked on it makes as bad union as it does when grafted on our common apple.

The Virginia is never troubled with blight, during a period of twenty-three years, although at times right in the midst of blighting trees, I never saw them affected. As to the influence of the stock on the top, affecting the time of ripening I cannot speak definitely as I haven't a variety bearing on its own roots to compare with the fruit that has been grown on a tree that has been doubleworked. But as near as I could judge don't think there is any difference.

I have a seedling of the Virginia which I am root-grafting to try as a stock. It has a better leaf and does not push into growth so soon in spring. Also will try a native crab as a stock, which I am using for crossing purposes. In the spring I intend to put the same variety on these three different stocks in order to note the difference, if any, in starting in spring, period of ripening, etc.

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The codling moth is like horticulturists generally; very æsthetic in his tastes; not like many of his specie in a less exalted sphere that find their birth-place and feeding-ground in decay. He is laid in a cradle, surrounded with sweet oders and beautiful colors.

Who of you that are delving into and trying to find out the principles, that give the peculiar characteristics to each individual seedling, can blame him for seeking after hidden treasure; they emplore as far as they can, toward the same objective point.

Our lamented friend, Mr. Dixon, gave us a complete antidote if used at the right time. Two applications are necessary for the best results; the first as soon as the blossom has fallen, as the moth is busiest depositing its eggs during the period of blossoming. Some have not applied early enough and consequently failed. The poison must be in the calix of embryo fruit before or by the time the egg is hatched; also, by applying early the leaf-roller that has increased so much in the last two dry seasons, will be caught while he is at work, and before he has incased himself in his little house. The second application should be applied within a week of the first. Last spring I used one-half pound of London purple to forty gallons of water for the first application, and a trifle stronger for the second, as the leaves just starting are very tender, and will be scorched if applied too strong. By mixing a small quantity the day before you want to use it, in the proportion of a quart of water to a half pound of purple, and stirring it well it will all dissolve and be ready for use.

The curculio has been another great hinderance to some of us who are trying to raise apples in the older parts of the State. With the loss of our cherry trees, which was one of their most fertile breeding places, their depredations have increased, and extended to fruits not legitimate to them. That the plum curculio stings and deposits eggs in the apple is beyond doubt in my mind. Of over two hundred curculios caught from the Duchess trees, one morning last spring, only five or six differed from those caught in the plum orchard. They will work more or less on most varieties of the apple. The Chenango appears to be exempt from their attacks, as I have never noticed one of their marks on them, though the trees are in the immediate vicinity of a plum orchard, while it is almost impossible to ripen a Duchess near the same locality; in fact they will find them in any part of the orchard. I have tried a good many plans and remedies to get ahead of them, but have never found anything effective, except to capture them with a sheet, a description of which was given in our report of 1884.

Have used it for the past four years and have saved a crop of Duchess each year from eighty-seven large trees, that sold at my own price, as there were no other Duchess in market.

After these years of constant warfare I find no diminution in their numbers, although a few of the eggs hatch, none ever arrive at maturity to continue the work; as I have yet to see a full grown larva in, or a place of exit made by one in escaping from an apple. They are migratory in their habits when their feeding ground is over-stocked, and will fly quite a distance on a warm day.

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Sometimes neighbors grow enough for home demand, and a generous supply for all others in need.

In conclusion, I believe by planting your plum or apple orchard in an isolated situation, where you could stock it with hogs and sheep, enough to eat up the fruit as soon as dropped, you could have perfect fruit and do away with the sheet.

Mr. Fluke, in illustration of his paper, showed several samples of different combinations in top grafting, also model of an improved ladder for gathering fruit, and a model of sheet for trapping curculio and gathering plums, all were donated to the society.

Mr. Watrous informed the society, that W. C. Haviland donated the large collection of sections of apple trees that were brought to show the comparative injury to different varieties by cold winters.

On motion the society tendered a vote of thanks to Mr. Haviland for the specimens donated.

.J. C. Plumb read a paper on Influence of the Siberian Crab on the Apple, as follows:

THE INFLUENCE OF THE SIBERIANS ON APPLE CULTURE IN THE NORTHWEST.

BY J. C. PLUMB, MILTON, WIS.

For many years a strong plank in my horticultural platform has been, that to best enjoy good fruit, and to insure a full supply, it must be grown around the home or in the immediate vicinity. This is especially true as regards the farmer and those remote from our larger trade centers, and my forty-five years of observation and experience in this line in Wisconsin and the Northwest fully confirm this view of the case.

Many farmers do sao that they can better and cheaper grow and sell a few bushel of grain, or a pig or two from the farm, to buy their supply of fruit than to grow it; which may be true from a mere money basis. But such is human nature and experience, that the outcome of such a course is to cut down the family supply of fruit to a mere luxury, instead of its being a part of the daily food of the household.

From this standpoint I will discuss the topic given me, leaving commercial fruit growing out for the time being, as I think you will agree with me

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that the greater interest lies in showing how to have home-grown fruit, especially the king of fruits, the apple.

Apple growing in the Northwest is yet an unsolved problem. In my own State, one-half its present and ultimate agricultural area is now practically appleless so far as home production is concerned. In the greater portion of Northern Wisconsin that standard of hardiness for the Russian families, the Oldenberg, is short lived or positively tender. Most of Dakota and Minnesota are still worse off in the way of hardy standard apples, while the great grain region in British America does not give us one example of success in apple tree growing. The northern one-third of your own State is yet in the uncertain stage of experimental apple growing, unless we except the rolling or bluffy oak lands of your streams and lakes.

From your State report for 1887, I find that your northern society recommended for general planting the Oldenberg, Tetofsky, Wealthy and Whitney only, with the Siberians Briar Sweet, Early Strawberry and Martha.

I need not spend further time to show the too well known facts of the case respecting your pomology. Nor can I here discuss the natural causes, which will remain a perpetual barrier to any general success in growing the standard commercial apples of the States east and south, or of Central Iowa and Southern Wisconsin. The facts are well known and the causes understood.

Here we haue an area of about 230,000 square miles of the finest habitable territory on our continent or the world, within our own bounds, with its hundreds of enterprising cities, and fast filling up with the most intelligent and progressive class that have ever peopled a similar territory, now numbering over two millions, and soon to be doubled and tripled. These do and will consume a thousand fold more apples than they can produce under the present condition of our pomology.

Will it always be thus? Must this great northwest finally depend on the east and south for its apples as it does for the peach? Shall the life work of so grand an army of pomologists be lost, such as gather yearly in these several states to compare views and experience on this and kindred topics, and whose years are largely spent in trying to grow applies successfully? But where lies the remedy? The main cause of the death of our apple trees in the northwest is conceded to be from our over rich vegetable soil, in conjuction with our climate of great extremes and sudden transitions of temperature, as well as the exhausting power of the prevailing southwest winds.

To change these natural conditions are largely responsible. Their effects can be decreased very much by the best modes of culture, drainage, and protection, as we all know, but the ultimate grand remedy lies in

VARIETY AND PROPAGATION.

Here we touch the unsolved problems of pomology, and which more than all others are at the front. Here is where veterans like Budd and Watrous join issue, and yet here is where, when the truth is discovered, all will

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be united. The present vision may be distorted by individual taste or self interest, and that which we now see "as in a glass darkly" will then be plain.

If this Russian apple question was my topic, I would at length give you my views. But now can only say I do not expect that race of the poma family is to fill the gap in home grown apples for that great territory, the northwest. For while they give us a hardy race of trees, their adaptability is not assured over more than one-fourth of the territory named above. They are at best coarse in texture and wanting in flavor, and do not give us so far a good winter apple; nor do I expect to find such among them for certain physiological reasons which I will name hereafter if desired. And yet the Russian apples are worthy of all the efforts made for their introduction, both for their intrinsic value as apples and, not less, as parents of a new race to come from cross-breading with the other extreme types, the Siberian and standard Eastern apples.

In connection with this Russian apple question I would remark that quantity before quality must be the rule of choice.

THE SIBERIAN AND CROSS-BREEDING.

The Siberian race of apples is too well known to spend time in enlarging upon its good qualities, of

First. *Hardiness*, which extends its growth over all the territory described as appleless, and hundreds of miles beyond the known possibilities of the Russian race.

Second. Early and prolific fruiting.

Third. Variety of flavor, fineness of texture and condensed richness of juices, beyond and far exceeding any other race of apples known to us.

Such, briefly stated, are the merits of the Siberian apple. Hence their value in cross-breeding rises pre-eminent; and here again opens a door to the realms of Pomona, which gives visions of triumph in apple growing in the near future.

The great mistake of our cross-breeding with this race has been in planting its seeds, expecting to get improved varieties thereby. The result of such planting has been not all encouraging, because the prepotency of this Siberian has reproduced in nearly every case the original type of the crab, and in its most crabby form. For twenty years, from 1847 down, I saved and planted annually, seeds from Wisconsin apples, and the crabs, as well. I have yet to know of one valuable addition to our list from the thousands thus produced. But from seeds of standard apples I have found and grown several hybrids of real value, which bore the evidence of having been pollenized by the Siberian flower. And so I reason that the best results may be expected from using the various classes of standard apples for the mothers, pollenized by the Siberian, which may thus be restrained or limited in its influence or potency on the offspring. For extreme hardiness we would cross the old red Siberian on the Hibernal, Oldenburg and Repka. For hardiness

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and quality combined, I would cross Transcendant orLake Winter on Utter, Transparent, Switzer, or even the best apples of the east.

These are given as examples only. I would expect both fair size and quality, with greatly increased hardiness of tree.

The Siberian for topworking has been discussed at length, but is yet a fruitful topic. The question of its merits is well attested.

(*a.*) It favors early maturity of wood growth, and consequent increased hardiness of top.

(*b.*) It secures early and prolific fruiting.

Examples:

Ben Davis on Cherry Crab.

Pewaukee on Transcendent.

Fameuse on Transcendent.

The Northwestern Greening on Transcendent and Virginia.

The only question left is that of adaptation of cions to stock.

Finally, the Siberian for canning, drying and jellies.

Domestic and factory manufacture of these products of the apple are looming up in the public estimation. America leads the world in these industries, and the American housewife is to-day in the front rank of this branch of demestic economy.

Dried apples, evaporated apples, apple butter, apple jellies, should and may be all or in some form a part of the every day diet of every family in the northwest.

The Siberian apple to-day outranks all other species or races in its economic value for these purposes in the northwest.

DISCUSSION.

J. C. Plumb: Jellies made for the markets are not made from fruit, but made from glucose and other substances, and flavored with fruits. Such jelly can be made by the barrel, at four to five cents a pound. I want ten cents per pound wholesale for my jellies. If you try to sell to the grocers, they will tell you that they can sell at retail at a profit, at lower prices than you propose to sell at wholesale. If you go around to sell to families, you will be told that they can buy at the stores for half what you ask. That is what they told me. However, I left samples, and soon worked up a trade, and this year I could have sold ten times as much as I had. We must make a market for our homemade products. The question is often asked why we do not have better Russian apples? And if it were not so late would like to tell the reason and talk about it. (Several voices, go ahead.) I fear we never will get winter Russian apples that will be good in cold countries, and I can give a physiological reason why they can not be good, and why we should not expect it. In 1876 I went with

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Prof. McAfee to the Government Pomological Gardens. We gathered a grip full of winter Russian apples, and I took them home. In early winter, when they should have been good, they were woody. For three years I studied this question. My theory is that they are so coarse in texture and the juice is so diffuse that they will not ripen in cold weather. The Seekel pear will ripen in cold weather; a pumpkin will not. The Longfield is a nice little apple, but what is the tree? It will not stand the extremes of Northern Iowa. I think we never will get winter apples from Russia that will be of good quality; I wrote this up several years ago and am more convinced of its correctness each year. A winter apple should be ripened up in cool weather, while a summer apple ripens by heat. I wrote to Charles Dowing about this theory. He said he never heard of such a theory being advanced. I spoke to Dr. Warder about it. He said he did not know, but wanted to think about it before he gave an opinion. I think I have heard Mr. Watrous say something concurring in my views on this subject. Our Russian apple friends do not like to hear this kind of talk, as it sets up a barrier against their dissemination.

A. G. Williams: How do you reconcile this theory with the fact that they have good apples in winter in Russia, as we are told by people who ought to know.

J. C. Plumb: I do not know anything about it over there. Charles Gibb, who stands at the head of the Russian apple business in America, in his letters to me and his published reports is very cautious in recommending them as good winter fruit.

C. L. Watrous: Col. Brackett and I, at the Pomological Society, talked with Mr. Gibb on this subject. I asked him if it was not true that the removal of a tree 500 or 1,000 miles from its habitat, either north or south, was not liable to change its characteristics. I asked him if it might not be possible that to remove an apple far to the south, it would have a tendency to make the quality thin and poor. He said that when they were far north at Kasan, they ate Duchess—if they were Duchess—it was so different it might be something else; admitting that they were so changed that he would not dogmatize anything about it, and its own father would not know anything about it.

J. C. Plumb: The Duchess on Lake Superior shore was a perfect wonder to me. They will grow along the lake clear around to Duluth. That is going to be the home of the Russians. They will

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make very respectable cooking apples. In the remarks I have made, it will be seen that the Russian apples are not for Southern Iowa or Wisconsin, but for the great northwest. Whitney will not succeed on the high table lands of Central Wisconsin. It winter-kills. The Transcendent does well.

C. L. Watrous: It will not do well here; it blights and runs out.

J. M. Elder: It moves north every year. It is becoming worthless with us, while up in Winnebago county it does well.

Pres. Patten: Lake Winter is much hardier than Transcendent.

J. C. Plumb: The Lake Winter is a cross of Red Crab and Fall Stripe or Saxon.

G. B. Brackett: From what I got from Mr. Gibb, I think the quality of fruit in Russia is very poor. The Russian pears are only fit for cooking. The reports as to Transcendent crab are conflicting. With me it bears well and does not blight on drift soil. There is a great difference on some parallels. The loess formation is the best; in fact the only fruit soil we have in Iowa.

Pres. Patten: I believe Mr. Plumb has given us a practical demonstration as to whether it is possible to get hardy varieties by cross fertilization. One example will serve to show what may be obtained by using the crab as the female parent, but it is one of the few exceptions as thousands of experiments have demonstrated. I refer to the Briar Sweet, obtained by planting the seed of the cherry crab that grew close beside a Bailey's Sweet. The apple largely predominating in the fruit, while the crab, impressed in large degree its hardiness, a fine blending for the two. We have a great deal of experience here in the West that should serve as a guide in this matter. Thousands of seedlings of the Siberians have been grown, but not more than one out of four or five hundred have any value, and very many of them must have been fertilized by good apples, as they were growing among them, and their size and appearance indicate it; but the quality of the Siberian fruit has almost always been transmitted to it, while in most cases where there has been a marked improvement in quality of fruit, the hardiness of the Siberian has not been maintained, proving rather, that hardiness is effected in proportion to the male influence on the fruit. My experience in planting the seeds of the Duchess does not support the view, that hardiness follows the mother plant to that degree that makes it safe to state it as a definite rule of action, and why should it? When we reflect that the varieties of cultivated fruits have been crossed and recrossed we know not how

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often. Of course the prepotent power of a thorough-bred, like the Siberian, will manifest its supremacy when crossed with our mongrel apples. We have failed to comprehend the situation. Had we again crossed our best apples upon our best hybrids and planted the seeds of these and of our own best fruits, we would be far in advance of our present state. By planting the seed of a good hybrid I have produced a tree 20 per cent hardier than Duchess, bearing a good apple averag ing larger than Fameuse. In planting the seeds of such hybrids, where surrounded by good sorts we are working in the line of sure development. A part of the character of the Siberion has been overcome, and the good variety has a chance to stamp the seedling with its good qualities. I do not considsr it chance if we plant seeds from a Duchess when surrounded with trees like Russet, Talman Sweet and Grimes Golden. It is not chance but a wise and hopeful selection.

J. C. Plumb: The Wolf River apples grown in Colorado, were perhaps equal to anything I ever saw.

On motion of Col. Brackett, the appointment of delegates to other societies was placed in the hands of the President of this Society.

Committee on resolutions reported as follows:

Resolved, That the thanks of the members of this association are due, and are hereby tendered, to "mine hosts" of the Goldstone Hotel Messrs Kettleman & Howe, for reduced rates and courtesies extended to, and comforts enjoyed by us, during the present session.

Resolved, That our thanks are also due to the different railroad companies for returning us to our homes at reduced rates of fare.

Resolved, That to Dr. Heinrichs, of the Iowa Weather Service, we return our thanks. for his able presentation, by his prepared maps, of the climatic conditions of the two continents, and especially, of the comparative climatic conditions of Russia and Iowa, and that a copy of his address be requested to be published in our transactions, together with photo lithographic copies of said maps and drawings.

On motion, the above report was adopted.

Adjourned to meet in rooms of the Society in the Capitol, at Des Moines, September 4, 1888.

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BOARD OF DIRECTORS MEETING.

Board met January 20th.

C. G. Patten, President in the chair. Geo. Van Houten, Secretary. Vice-President Secor and Directors Lathrop, Gardner, Elder, Watrous, Thatcher, Fluke, Collman and Speer.

On motion of C. L. Watrous the Librarian was authorized to procure by exchange, volumes of all State and other Horticultural Societies in the United States and Canada, whose work is similar to our own.

On motion of R. P. Speer, the committee on rooms authorized to make rules to govern the library, and the taking of books from the same.

H. W. Lathrop offered the following resolution:

Resolved, That there is hereby appropriated, to furnish the rooms, and prepare and display objects of interest and instruction, in our line of work, $1,000 or so much thereof as is necessary, to be expended under the direction of the committee on rooms.

Carried.

On motion of C. L. Watrous, the committee on library was authorized to expend $500, or so much as is necessary, in making additions to the library.

C. L. Watrous moved that Col. Brackett be appointed our representative at Agricultural Society for next State Fair.

Carried.

C. L. Watrous moved that we allow custodian of our rooms, when necessarily employed in the work of his office, four dollars per day and necessary railroad fare.

Carried.

On motion of H. W. Lathrop, the Secretary was directed to collate and publish rules governing experimental stations and publication of reports.

Carried.

On motion of R. P. Speer, the custodian was directed to procure

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rooms, in the basement of the capitol building, for fruit display and for storing surplus volumes and property of the Society.

On motion of C. L. Watrous, the Executive Committee was requested to appoint M. E. Hinkley, of Marcus, as Director of the Tenth District.

A. F. Collman moved that the Experimental Committee be authorized to expend $250 for stock for experimental stations.

R. P. Speer moved to amend by adding $50 to the amount.

Amendment carried.

Motion as amended carried.

On motion of C. L. Watrous, it was decided to hold a meeting of the Society in rooms of the Society on Tuesday of fair week, 1888.

On motion of C. L. Watrous, the custodian was authorized to consult with the Secretary and others of State Agricultural Society, in regard to revision of fruit list, with a view of improving same, so as to get a good fruit show.

On motion of C. L. Watrous, the committee on horticultural rooms was authorized to use so much of unexpended balance of last year as will carpet the room and buy a broom and other necessaries for the rooms.

Bill of H. W. Lathrop, expenses attending meeting of Board of Agricultural Institute, allowed.

Motion by C. L. Watrous that a warrant for $40 be drawn and forwarded to the Treasurer of Institute organization.

Carried.

Adjourned.

GEO. VAN HOUTEN, *Secretary.*

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APPENDIX.

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ADDITIONAL REPORTS AND ESSAYS.

Some of these papers were either not discussed or not read, for want of time.

A few were not received in time to be put in where they should have been. A few, on account of being condensed or re-written, lost their appropriate places in the report.

LIST OF FRUITS RECOMMENDED FOR CULTURE.

(The Society did not revise list at meeting held in Des Moines, January, 1888. The following lists were adopted at Charles City, January, 1887.)

SOUTHERN DISTRICT.

APPLES.

Summer—Duchess, Whitney (for trial), Grand Sultan, Thaler, Yellow Transparent.

Autumn—Lowell, Fall Orange, Wealthy, Fameuse; for trial, Longfield.

Winter—Roman Stem, Grimes' Golden, Janet, Jonathan, Ben Davis, Willow; for trial, Antonovka.

Crabs—Alaska, Hyslop.

Cherries—Early Richmond, Late Richmond, English Morello; for trial, Wragg.

Plums—Wild Goose, Forest Garden, Miner, De Soto.

Currants—Red Dutch, Cherry, White Grape, Fay.

Grapes—Moore's Early, Worden, Concord.

Raspberries—Turner, Gregg, Shaffer's Colossal.

Blackberries—Snyder.

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CENTRAL DISTRICT.

APPLES.

Summer—Oldenburg, Benoni, Cole's Quince, Whitney Sweet June.

Autumn—Wealthy, Fall Orange, Dyer, Fameuse, Autumn Strawberry, Flory, Lowell, Maiden's Blush; the last two top-worked.

Winter—Willow, Ben Davis, Roman Stem, Jonathan, Walbridge, Seever, Sheriff, Tallman Sweet, Black Annette; for trial, Longfield, Yellow Transparent, Thaler.

Crabs—Hyslop, Martha, Minnesota.

Plums—Miner, De Soto, Forest Garden.

Cherries—Early Richmond, English Morello, Montmorency, Wragg.

Grapes—Concord, Worden, Moore's Early, Martha, Pocklington.

Strawberries—Crescent, Chas. Downing, Downer's Prolific.

Raspberries—Gregg, Tyler, Souhegan, Turner, Cuthbert, Shaffer's Colossal.

Currants—Victoria, Cherry, White Grape, Red and White Dutch; for trial, Fay.

Gooseberries—Houghton, Downing.

NORTHERN DISTRICT.

APPLES.

Summer—Oldenburg, Whitney, Tetofsky.

Fall—Fameuse, Gross Pomier, Wealthy.

Winter—Tallman Sweet.

For trial—Yellow Transparent, Thaler, Longfield, Repka Malenka, Charlamoff, Red Transparent, Hibernal and Roman Stem, top-worked on hardy stock.

Crabs—Briar's Sweet, Martha.

Plums—De Soto.

Grapes—Moore's Early, Worden, Concord, Janesville.

Currants—Victoria, L. B. Holland, Red and White Dutch, White Grape.

Strawberries—Crescent, Wilson, Glendale, Red Jacket.

Raspberries—Shaffer's Colossal, Turner, Gregg, Doolittle, Mammoth Cluster.

Blackberries—Snyder; for trial, Britain.

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LIST OF DELEGATES TO ADJOINING STATE SOCIETIES.

Nebraska, George Van Houten, Lenox.
Illinois, G. B. Brackett, Denmark.
Minnesota, Elmer Reeves, Waverly.
Wisconsin, O. A. Kenyon, McGregor.

If any delegate is unable to attend the Society to which he is appointed he may select an alternate.

C. G. PATTEN, *President.*

The following papers were either not discussed or not read for want of time:

ORNAMENTATION OF CITY GROUNDS.

The thought most naturally presented by the title is that of a yard a few few feet square on a paved and dusty street. Light and fresh air is the great desideratum among city folks generally, consequently large trees are not desirable, neither are they appropriate. They should be planted along wide streets, but not in the yards.

The first requisite for a nice lawn is a deep, mellow, rich, well prepared soil. It should be put in good tilth to a depth of eighteen inches or two feet. It should then be carefully graded. Ordinarily the grade should be toward the road. When there is quite a fall and danger of washing it is sometimes necessary to build a terrace. Where there is much surface to drain the water should, if possible, be carried by an underground drain. If this is impossible, and the descent is abrupt, stone or brick should be laid edgewise where the water runs. When the ground is prepared the next effort should be towards securing an even graft turf.

There are many mixtures of lawn grass seeds which will answer the purpose well.

Before going so far as this the locations of walks, etc., should have been decided upon.

A small lawn should, to some extent, at least, be a large one in miniature. Therefore some trees should be planted. These should be of small growing or dwarf varieties. Among evergreens, plant Dwarf Arbor, Vitæ Savin,

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Red Cedar, and the Spruces. The last two should be kept sheared. The Savin may be used with good effect around rock works; the dwarf Arbor Vitæ in hedges along the walks or borders of the lot. If there is an objectionable view it may be hidden by a hedge of larger growth.

Too many ornamental shrubs spoil the effect of any lawn. Have but few, and those of choicest varieties. Keep them pruned, and vigorous in growth. Some desirable ones are Hydrangea, Paniculata, Grandiflora, Syringa, Wiegelia, etc.

Two or three choice roses should be planted. Such varieties as La France, Madam Chas. Wood, Gen. Jacqueminot require considerable care and winter protection, but they will amply repay all the labor bestowed upon them.

Upon veranda or upon an ornamental lattice, some choice climbing vines should be grown. Probably the clematis, such as Jackman, Purple and Duchess of Oldenburg, white, are most popular at present. They require rich soil and some attention. Where ranker growth is wanted the Benoni is desireable. It produces large bunches of curious and very pretty flowers. The well known Wisterias are also useful where a large amount of foliage are wanted. The lillies, especially the Aratum, may be used with good effect either in large pots or in the open ground.

But the great charm of lawns, small or large, is having them kept neat. Keep every thing growing thrifty as possible, trim off all straggling growths, keep the grass cut, and every spring give your lawn a dressing of some kind of fertilizers. If possible the lawn should be watered in dry weather. The water will do more good if put on all at once than if the same amount were sprinkled on during three successive days.

I suppose that parks and cemeteries are proper subject for treatment in this paper. The modern idea of parks is to imitate the most desireable effects of nature. The geometrically laid out gardens of the Dutch and English, are things of the past. Still they are as ornamental as those of any other stereotyped from; many of our parks are but a repetition of a path with a curve in it, and bush of regulation size in the curve. In large parks there is no finer effect produced than where one comes apparently from the forest, suddenly upon a little meadow where nothing but the wild grass is is allowed to grow uncut. In every park, the oaks, pines and spruces should have places. The hickory tree and birch are also fine for such work. Where the water is obtainable, a running brook with shady pools, cascades and a quiet lake, add much to the beauty. If nature and art are combined as to harmonize, beauty will be the result, but if either is followed blindly, failure will follow.

In arranging cemeteries, the park plan is desireable, especially where the surface is uneven. Shade trees should be planted along the road ways and in spaces reserved for the purpose. But no large trees should be allowed on occupied lots. Ordinarily they discolor the marble, and if the lots are small, interfere with the growth of flowers and shrubs on adjoining lots. The dwarf Arbor Vitæ's, such as the *Globosa* and Siberian, are well adapted for low hedges around the lots. The savin may also be used with good effect occasionally. Aside from these, only shrubs and flowers should be

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allowed on the lots. White roses are especially appropriate. The best for this purpose perhaps is Mad. Plantier.

REPORT OF DIRECTOR OF THE FIFTH DISTRICT.

BY H. W. LATHROP.

The history of fruitgrowing in the Fifth District for the year 1887 does not afford much for the encouragement of the fruit growers. While our orchards will supply us with enough summer and fall apples for home consumption, and perhaps a surplus. When the Fameuse has left us in November, we have only the Roman Stem and Iowa Blush remaining for dessert apples; and their season is early winter, and the former is so shy a bearer that it takes an abundance of trees to furnish a supply of apples. In this state of affairs we rely almost entirely on eastern markets for our supply. The old orchards are dying out, and many tree planters are waiting to learn what trees can be planted that will endure the rigors of our climate and bear fruit.

For so dry a season the crop of small fruits was fair, though raspberries and blackberries suffered more than others.

The grape delights in a hot climate and a dry soil, and the last season was adapted to it and it to the season, the fruit being free from rot and in perfection as to quality.

I have addressed letters to several parties in different parts of the district, containing inquiries in relation to new varieties of winter apples and other topics, but have received replies to but one, which I make a part of my report.

There are a number of promising new hardy winter apples in this district that are but little known, that I had intended to hunt up and learn their merits and present them at this meeting, but I have been unable to obtain facts respecting them worthy of presentation at this time.

FAIRFAX, January 10, 1888.

H. W. LATHROP, *Respected Friend*—Your note of December 30th came to hand this morning, and in answer will say * * *

1st. The drouth did affect our apple trees. It found them in a weak and sickly state, when they were in need of a damp soil and a moist and bracing atmosphere in which to recuperate. Then the heavy bloom was another severe tax upon the scant moisture in the tree when it was trying to fulfil nature's work in the production of fruit. But nature had to yield to the multiplied misfortunes that overtook our trees.

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2nd. The apple crop was very light; Duchess, a fair crop; Fameuse, a fair crop; Willow, a good crop, Some other sorts bore a few specimens.

3d. Small fruits in Linn county, a fair crop, with good prices. Grapes, a large crop, and no rot. Let me add here that our grape growers are becoming far more successful as they learn to properly care for their vines. The system of trimming is having a wonderful effect on the crop.

4th. The crop of plums was a failure. We had good bloom, but an eastern storm or something else at the time of blooming destroyed the pollen so that we got but little fruit. On old trees not enough cherries to speak of; the young trees bore a few.

5th. Do not know of any valuable winter apple that has not been brought out, but I wish to say a good word for the Black Annette. It is worthy of more attention than it has received.

6th. I do think insects were more troublesome than usual. The white or wooley aphis I fear will prove hurtful, and especially those that work on the roots.

7th. I hear nothing of the Ishewood apple. Mr. Fisher, who was propagating the trees, has dropped out of our fruit meetings, but I learned from Mr. Bowers before his death that they have badly bark bursted.

* * * * * * * * * *

Let me add before closing that the planting of plums and small fruits in this vicinity will be in excess of any previous season.

Very truly yours,

C. P. OSBORN.

REPORT OF DIRECTOR FOR TENTH DISTRICT.

BY M. VINCENT.

After another year's experience we can report some progress, or at least we believe that we have some reasons to feel encouraged.

While the winter of 1886 and 1887 set in very early, with a remarkably heavy fall of snow on November 15th, there was not so great a loss in orchards as in several years previous. The Duchess, Wealthy and Whitney's have stood very well, and have yielded good crops when set long enough to come into bearing.

Blight has troubled us somewhat, but not so badly on older trees as in some former years.

Plums yielded a good crop of fine fruit; the Forest Garden and De Soto giving best satisfaction.

Cherries seem to be a failure in this region. The Early Richmond will

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live long enough to come into bearing, but after one heavy crop of fruit will winter-kill.

English Morello is worse, if anything, than the Early Richmond.

We have none of the new Russian cherries in bearing, in this district, that we know of, but feel sure that some of those varieties will eventually become valuable for this climate.

Strawberries were a good crop and brought good prices in home market. The best varieties for us are Crescent, Glendale, Manchester, Wilson and Charles Downing.

Raspberries yielded a fair crop, the Cuthbert and Turner for red and Tyler, Early Ohio and Gregg for black caps, taking the lead.

Blackberries were a fair yield, but there are not many being grown. The Snyder is the only one that is planted to any extent.

Grapes have done very well. There are no vineyards planted, but enough has been learned by those who have planted in a small way to make it certain that grapes can be grown in this district very profitably. The Concord ripens generally with us and the Worden is a sure crop. In some instances the Delaware has done well.

Currants and gooseberries have done very well and have yielded fairly.

From all we can learn we think it would be well for our fruit growers to try some of the best varieties of dewberries, and would recommend the Lucretia.

Our district is entirely free from any natural timber, and the cultivated fruits and cereals do better where protected by shelter belts and wind-breaks; hence our farmers should set such trees. We would like to see such protection upon every farm. If this were the case, the strong winds that cause so much suffering would be greatly lessened.

Of the more valuable forest trees we would mention the black walnut, the white elm, white ash and the European larch. Box elder, maple and cottonwood may do for a temporary wind-break, while a better one of the other varieties is growing, but we would recommend them for nothing else. We have already demonstrated that many of the better evergreens may be profitably grown in this section. The Scotch pine, white pine and Norway spruce, arbor vitæ and red cedar do well and merit extensive planting.

REPORT FOR SECOND DISTRICT.

BY F. W. TAYLOR, DIRECTOR.

A report from the district I represent must contain much that is not pleasant to think of, as well as that which is recalled with pleasure. The

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season was one of almost unprecendented drought, and the result was of course very apparent on the fruit crop. Last spring's plantings of small fruit plants were largely lost by reason of the heat and lack of moisture. Crops of fruit were also materially lessened. In our immediate vicinity most plantations averaged less than half a crop, especially in small fruits. Old plantations and those which had not received the best of treatment, bore little or no fruit; but those that had been carefully pruned, and received thorough cultivation, bore in some cases large crops.

The cherry crop was the nearest a complete failure I have ever seen. The failure was due to a late frost, which ruined the fruit just before the blossoms opened, At the same time we had a severe sleet, and between the two visitations there were scarcely cherries enough left to make one square meal for the birds.

The English Morello was the only kind that bore even a little fruit.

Our plum crop also very poor this season. We have on our place trees of bearing size of Miner, Wild Goose, Forest, Garden, Quaker, Lombard, *Simonii* and other varieties, nearly one hundred trees in all, yet we had scarcely any fruit, while last year we had it by the bushel. Such are some of the pleasures of fruit growing in our vicinity. Yet all farm crops averaged little if any better, so we cannot admit that the fruit grower is specially persecuted.

The crop of apples was better than that of any other fruit, and was fair. The only drawback to this department was that most kinds ripened much earlier than their proper season so that winter apples were in good demand at good prices.

Ou our place the following varieties bore good crops:

Duchess, Sweet June, Benoni, St Lawrence, Snow, Haas, Grimes, Golden, Wine Sap, Ben Davis, Roman Stem, ane Red Romanite.

Grapes bore a very heavy load of fruit, but brought good prices for good quality.

We had good returns from Concord, Agawam, Martha, Lady and Brighton, but the Worden came out best of all.

The grape is certainly a great acquisition and worthy of the most general planting in this section.

The general health and vigor of the fruit trees and plants in our section is good and we are recovering from the bad effects of the severe winters we had, so that I think our outlook is better than it has been for some years.

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SOILS FOR FRUIT ORCHARDS.

EDSON GAYLORD, NORA SPRINGS.

Some months ago I received a notice from both the Iowa and the Northern Iowa Horticultural Societies, to prepare a paper on the subjects of soils, locations, and setting orchards. By these notices it appears that those who knew me least as well as those who knew me best selected me for nearly the same subjects. Since being selected to give my views on these important subjects, I have made a tour of some three hundred miles chiefly for studying and ferreting out the leading causes which have wrought such ruin with our fruit trees. For one I have resolved to embrace this golden opportunity and not fold my arms till I have gathered from the wreck some lessons of future usefulness. We learn much from our fathers' successes and their failures.

In this article I intend to confine my comments as closely as possible to the subject of soils. One not having investigated this subject would be surprised to learn the different influences the various kinds of soils have on the success or failures of our fruit trees. Some who take great pains and lay out much money in fruit trees have the poorest success. Not infrequently they fail to learn what has been the causes of their ill success until they have squandered hundreds of dollars in time and money. Let no one set out a fruit tree till he has seen the various stratas of soils which underlie the site designed for an orchard. Let him know, too, that the sub-soil is of far greater importance than the surface soil. The surface is of little consequence as compared with the third, fourth and fifth feet of sub-soil. Hence, to make my subject plain and practical, I will make special mention of a few of the many hundred orchards which have come under my notice. These will speak stronger than any language.

As you pass south from the mouth of Flood Creek through Clarksville and east till you reach the prairie, you find one general scene of desolation among the fruit trees. As you pass southeast out on the high rolling prairie towards Wavely you find good surface soil for common farm crops. Under this surface soil is a thick layer of compact, heavy sub-soil. This neighborhood for some miles around is what might be termed high but not dry land. The Clarksville flats are what might be called low dry land. The fruit trees on the latter soil are almost entirely ruined; scarcely any thing save the crabs have survived. So at Plainfield on the Cedar. The same is seen between Cedar Falls and Jonesville on the east side of stream. But on the high lands between Jonesville, Waverly, and Clarksville, in the region of

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this heavy retentive sub-soil, are found some of the best trees in northern Iowa. We cite the orchard of Norman and Deacon Reeves, near Waverly. In these orchards are found many of the old varieties in good condition. Particularly is this true of the trees in the Deacon's orchard, which are among the largest and oldest apple trees in northern Iowa bearing a fair crop since '84. We found at Cedar Falls on the lands of Mr. Hartman some very old, fine trees which are to-day in very fine condition and have borne fine crops since '84 and are well set for a fine crop the coming season. He has large trees of the Fameuse, the Wealthy topworked on Plumb's Cider and the Pewaukee topworked on Hubbardston's Nonesuch, all old trees and in fine condition. The sub-soil under these trees is heavy and retentive. In Mr. Welling's orchard near by we find similar conditions, many of the old varieties bearing well since '84.

We will make note of only two orchards at Nashua, owned by Mr. Pitts and Mr. Cooler. These orchards each have strips of sandy sub-soil, and are entirely used up on this soil, while on the remainder which is on heavier soil the trees are doing much better. There is an orchard owned by one Bushnell, near Clear Lake in Cerro Gordo county, which is the most remarkable orchard on record. In it are found the Fameuse, Haas, Wealthy, and Walbridge, and to all appearances they passed through '84 and '85 unharmed and are now in a healthy condition. Mr. Bushnell has also a number of Early Richmond cherry trees that have borne fine crops of cherries since '84. This orchard is on high rolling prairie sloping north and east with only a slight protection on the south. The surface soil is sand and clay loam for some fifteen inches deep, then comes five feet of hard compact sub-soil, a conglomerated mass of sand, clay and gravel pressed and firmly packed together. Next under this is a layer of sand. There is another orchard on Line Creek in Cerro Gordo county, near Portland, known as the Adams orchard. It has my chosen slope, northeast, with no protection. The general surroundings are perfect. The soil below the first foot is quite sandy from four to five feet; then comes solid limestone rock. The last foot lying next to the rock (as near as we have been thus far able to learn) is a mixture of shale which we believe to be very good to promote the health of trees. This orchard contains many kinds, the most of which are found quite healthy except such as have been killed by the pocket gophers eating the roots. The Walbridge in this orchard are in fair condition. This orchard is one of peculiar characteristics. The first foot and the one immediately above the rock are all that could be desired. The soil between the first and last foot is not quite as heavy as would be desirable. But the soil as it is, together with its most favorable surrounding, make a location next to the best.

There is a number of other kinds of soils that are favorable to fruit growing. One kind has the first eighteen inches of sand and clay loam, then some two feet of light clay resting on a foot or more of shale with limestone rock underneath. A sound rock four or five feet deep is not desirable. We should carefully avoid setting fruit trees on loose open sub-soils, and equally avoid setting orchards on heavy blue clay sub-soil; in short, avoid such as

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resin-weed soil, which is commonly underlain with heavy clay for a number of feet deep.

Nature appears to have had a fine sense of discrimination as to kinds of soil best adapted to further her ends in the development of the varous kinds of forest trees. Our oak soils are among the best; the white oak soil we count best, but nearly as good are the jack oak, poplar, and burr oak soils mixed. Poplar or aspen soil are not objectionable if it is elevated and sloping.

In conclusion, as a general illustration, never select for an orchard site land that by reason of dry weather would shorten a crop of corn. Those who are interested in the question of soils should bear in mind that all soils for orchards must be good soils for corn, but that extraordinary good soils for corn are not good soils for fruit trees. We wish to criticise the quite too common advice given by some of our leading horticulturists that an orchard needs high dry ground. The advice is quite popular; but we deem such counsel, unless qualified, very unwise and quite certain to bring disappointment to many who follow it. No site with an unusually dry soil is suitable for any fruit grown in the northwest.

Nature in her own unaided selections has displayed an unusual amount of sagacity and wisdom. Our gigantic oaks, walnuts, butternuts, ash and elms, are universally found on rich, warm surface soils and only a few fee above the level of running or standing water. The famous original Wolf River apple tree that has excited such universal attention, stands on the bank of Wolf River only two or three feet above the waters. Some of the oldest apple trees known in Michigan which are still healthy and vigorous are only two or three feet above water.

From these facts and thousands more which point the same way, the conclusion is reached that most all trees which have been notably successful are so located that their tap roots reach minerals and moisture. Mr. Bushnell, of Clear Lake orchard, says: "It has been surprising, in digging a pit among my fruit trees, to see how persistently the roots have forced their way down a number of feet into the excessively hard soil that underlays my orchard."

ENTOMOLOGY.

BY A. F. HOFER.

The subject assigned me for this meeting is an important one, and it would require an experience of many years to be able to treat it satisfactorily. "Diseases and Insects Injurious to Grapes," is the subject.

As to the first part of the question I can answer for the northern section of our State.

I can safely say that neither the grapevine nor the fruit, is infected with any kind of disease, provided we plant the healthy varieties.

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The influences of climate, of temperature, draught, moisture or the condition of the soil may produce imperfect fruit, but these causes cannot be classified under the name of disease.

In a wet, hot summer, mildew may injure the grapevine, the grapes may rot and drop to the ground, but if we have done our duty in thinning out the vines by removing all the useless foliage, and all the sprouts which we do not need for next year's bearing, our vineyards will stay clear of mildew, provided we do not raise any Clinton, Northern Muscadine, Ives and Deleware. The Clinton ought to be abolished by law on account of its uncontrollable growth. The Northern Muscadine is not much better, and the Deleware is not much better, and the Deleware will only do well in dry seasons, although we cannot do without it.

The man who puts his trust in Concord, Worden, Hartford, and into the different kinds of Roger's hybrids, will not be damaged much by the disease, which is called *mildew*. Some learned naturalists are inclined to the theory that mildew is a kind of insect which they call infusária, again, others call it fungus, a kind of a sponge or dry rot, which I believe comes nearer to the truth. I think, and in fact know mildew is the gathering of the evaporation from damp soil, which always accumulates on the underside of the leaves or fruit for lack of sunshine and ventilation.

In the years 1886 and 1887 we had no mildew. The air was dry and the sun was hot, the weeds did not disturb the growing fruit. The leaves were able to absorb the perfumed atoms of the morning air, and the clusters of the noble fruit developed to a perfection very seldom achieved.

As to injurious insects I will refer to the volume of horticultural report for the year of 1885, where the friends of the vine can read most I know on this subject.

There are but few kinds of bugs and spiders which are injurious to the grape, and after we know them, and take care of them, it is easy to avoid the damage, they can inflict on the vine and its fruit, but if we let them have their own way they can do much harm, and even may succeed in ruining a vineyard by a few years of free activity.

The little black beetle which eats itself into the swelling bud during the warm April days, can ruin from two to four pounds of grapes yer day if we do not crush the life out of him, but we have to act quickly or we will not succeed, because his flea-like nature enables him to be *not there* when you want to put your finger on him.

The foul black spider, which twist the leaves together and deposits thousands of little red eggs into them, will infest every bunch of your grapes before they are three-fourths grown if you do not know him, when he does his work in the month of June. These eggs will go traveling in three or four days, and then it is impossible to follow them. If you find such a leaf which looks like a half finished cigar on both sides or edges, you had better grasp it at once and rub it to powder, and you never fail in destroying hundreds of little red spiders.

The grown up spider of this kind is a hard customer to get hold of. I call it a spider, but indeed I do not know whether it is an ant or a

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spider or either. It looks like something between the nomadic ant and the common spider, and as we have Victor Hugo's devil-fish, we might call it the devil-spider. It is indeed a nasty, dispicable insect, and if the serpent in the garden of Eden had looked somewhat like it, old mother Eve would never have tasted of the forbidden fruit.

This same insect is also an enemy to the young plum tree, where it deposit its eggs also, and where the nomadic ant goes every hour of the day. What the ant does there I cannot account for, but I know for certain, I lost some fine young plum trees by the combined action of these insects.

PRESERVING FRUITS FOR EXHIBITION.

BY. L. O. WILLIAMS.

As my experience with this subject is quite limited, my object will be mainly to provoke a discussion whereby I may gain some desired knowledge. Upon receipt of our last horticultural report, I noticed my name placed for this topic.

I accordingly set to work in a very limited way—for want of time—to ex-experiment in this line.

I purchased an ounce of salycilic acid, and tried dissolving it in water, but without success. I then went to a druggist for instructions, who gave me some bicarbonate of soda to dissolve it with. I afterwards learned through a correspondence with our secretary that alcohol was the best solvent—using about half a pint of alcohol to an ounce of the acid,—diluting this with near a pint of rain water. I also learned from the same source, that the acid used for this purpose, should be made from the willow instead of wintergreen. Thes instructions came too late, however, for me to follow conveniently this season, so I will give the results of experiments as already started. I used ordinary colored tissue paper, cut into squares of suitable size to wrap the larger specimens of apples. These I spread in a pile on a table and wet them by means of a sponge dipped in the acid. Two or three thicknesses of paper may be wet at a time, in this way, and as they become wet may be taken off one at a time and spread out to dry. With the paper thus prepared, I wrapped about a dozen carefully selected specimens each of Sops of Wine and Sweet June.

At the same time I treated a like number of specimens with a preparation of "McMaddens Fruit Receipt." My wife paid the agent a dollar for the receipt, but as I am pretty well satisfied that it is a humbug I will "give it away." Here it is: "For all kinds of fruit: Six lemmons and two oranges peeled, boil the jince five minutes. Put in one gallon of syrup, made of

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white sugar, boil 20 minutes. Put on the fruit cold." Has any one tried this receipt and found it successful?

I dipped the specimens referred to in the syrup, and then wrapped them in tissue paper. This was not perhaps a fair test of the virtues of the receipt, but I could discover no virtue in it whatever. I placed all the apples—treated both with the acid and syrup away in a cool case, afterwards removing them to a wood shed. I found at the end of three or four weeks that decay had already set in and was making headway very fast among the "syrup" specimens, and as I had both lots in the same box, I think the latter specimens had much to do with the decay of those treated with the acid. At the end of about six weeks my specimens were all rotten.

In order to give the acid a more through test, I gathered about twenty-five fine specimens of Whitney's No 20, and carefully wrapped them in paper, saturated with the acid.

As a final result, I have seven quite perfect specimens on hand to day, (Jan. 18th.) Now, if Whitney's can be kept thus for four months past their season, I am satisfied that any of our ordinary fall and winter varieties of of apples may be successfully kept in a perfect condition for the same length of time.

NEW CHERRIES—THEIR VALUE—PROSPECT OF IMPROVEMENT BY SEEDLING PRODUCTION.

BY C. W. BURTON, CEDAR RAPIDS.

The committee on program evidently made a mistake in assigning this topic to me. I can account for it only on the supposition that they have not entirely discarded the old hap-hazard idea of sowing bushels of seeds of promiscuous and unknown parentage to obtain one tree, only in this case they blindly selected one seed out of the bushels, perhaps with a reckless, but forlorn hope, that the long sought seedling would be the result. If success in their other horticultural experiments prove as abortive as this last venture, we may well hang up our spades and pruning hooks, for the possibilities, nay probabilities, of improvements of Iowa fruits may be set down as very uncertain. I hope, however, that this is indeed their last blind experiment, and that hereafter, their work and ours also, shall be conducted in accordance with much accurate knowledge and a well considered plan.

For many years I have sat at the feet of the Gamaliels of this society, so that whatever of truth or error, of wisdom or foolishness, this paper may contain, you, my teachers, must largely bear the responsibility. All that may be said of the prospects of the cherry, may be said with nearly the same propriety and force of the other standard fruits, I shall therefore, first discuss the broader and more important subject.

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How to secure a brighter out-look for Iowa fruits—But I shall not confine myself closely, even, to this subject, but shall occasionally digress to offer a few theories, which if correct, will partially explain some of nature's mysterious operations that present themselves to every thoughtful horticultural student.

The old method—The question, how to improve our fruits, is one that horticulturists have long been studying, but have never satisfactorily answered. The difficulty is, in my opinion, we are working at the out-set on a wrong principle—the naturalization of foreigners. We have diligently searched Europe, Asia and America, with the hope that somewhere on the face of the earth, varieties of fruits might be found, that are exactly adopted to the vicisitudes of our Iowa climate, and completely meet our every want. In this search I think we have failed and it is time to abandon such delusive dreams. Can we reasonably expect to find two localities on the globe, unless it be a few oceanic islands and sea coasts in the same latitude, so similar in every respect that trees native to the one may be successfully transplanted to the other?

In one respect, the signs of the times indicate an improvement in our experimental work. We are gradually giving up the old notion, that success can be soonest attained by scattering broadcast millions of seeds, without thought as to the character of their ancestors. Our eyes are at last being opened to the fact that nature has pursued this method for thousands years with indifferent results, and we have come to believe that man is a necessary assistant in this work, and that improvements can only be secured by artificial selection, judicious crossing and the wholesale destruction of inferior sorts. Nature never attempts this this part of the work. It is always left to human foresight and skill.

It is unnecessary in the discussion of this subject to inquire how plants grow. Many able and exhaustive papers on this topic are found in your reports. The important questions to be considered are, what are the influences that determine the characteristics and habits, and how to make the best use of this knowledge to secure improvement?

Vegetable life—I think it will not be disputed that every plant possesses an individual life, which, though dormant for an indefinite time, as in the seed or in the plant cells in winter, is capable when awakened of vitalizing other atoms, that have been stored up during the previous summer. This vitalizing process consists also, in arranging these atoms according to a definite plan, and developing from the seed, with the aid of light, heat and moisture, the growth of an independent, separate, but perfect tree. By a wise foresight the supply of food has already been digested and fully prepared, so that nothing remains for the young life to do, but to appropriate it in the manufacture of its own body. This it immediately proceeds to do. It sends out its own rootlets into the warm damp soil, and pushes its white stem into the air. Now the new child is born. The sunlight greets it and a green coloring matter is deposited. The tiny leaf peeps forth and the growth of the plant is commenced.

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A few scientists teach that plant life is not a force in itself. They say, even, that the work of the human muscle in lifting the hammer is not an actual independent force. It is a latent power inherent in the food, which the stomach has previously digested and which the will of the individual has released. To the ordinary mind it is immaterial what does the actual work. That which directs and controls any force in nature is the greater power. What though the cause of the upward flow of sap in the tree is capillary attraction, or the power of diffusion of liquids through thin membranes or atmospheric pressure, or some other natural force, this fact remains unaffected, that neither of these forces, nor all together could lift a single drop of sap nor digest it after it was lifted, nor arrange its atoms so as to form the many different vegetable products unless set in motion and directed by a supervising vital force. This is the life force of the tree. And by whatever name it be called, whether it be action induced by chemical affinity, or the influence of the sun's light or heat, it accomplishes in the living plant what the chemist has never accomplished, even with aid of all the other forces, the combining of inorganic materials into compounds that alone support animal life.

Progressive Development—If now it be admitted that life is an independent force, the following are to me reasonable conclusions:

1. Plant life is the same, except in degree, as animal life, and has been developed from pre-existing forms. Slowly from generation to generation, from century to century, has this developing process gone on, ever changing from simple to complex, the better to meet the varying conditions of soil and climate. There was a time far back in earth's history when there were but few forms of vegetable life, and out of these have gradually evolved the thousands of different species of the vegetable kingdom.

2. The characteristics of every plant are made up from two distinct sources, inherited and acquired. The seed is vitalized by and contains a part of the life and character of its parents. The tree is a continuation of the first vegetative impulse and possesses, in some degree, the tendencies and peculiarities of all its ancestors. If there were no acquired traits, and only those given to the first parents, transmitted, there could be no improvement. But the fact that each new condition surrounding the tree stamps a new character upon its life, and which also is continued in its posterity, affords great hope that the possibilities of any fruit are almost unlimited.

With these facts before us, our course is plainly outlined. We have only to select from nature the best variety of fruit she has produced, and by adding new surroundings bring out new varieties. By continuing the process of selection and cultivation for an indefinitely long period of time, varieties will at last be evolved possessing characteristics and habits adapted to our climate and supplying our necessities. For this purpose the materials are already at hand. Our groves supply native wild seedlings of most of our fruits, which are hardy and long lived—two qualifications our ideal tree should possess. These trees are not sports. For thousands of years they have been surrounded by the same conditions and have not changed their habits of growth nor qualities of fruit. Their seeds reproduce their origi-

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nals, and therefore possess, as I hope to show, the greatest prepotency or vitalizing force, when crossed with other species or varieties. The problem is less difficult and the time of accomplishment materially hastened, if a specimen of native fruit of very superior excellence can be found, that can be transplanted to an isolated place, where it can receive a more generous treatment and be far removed from the fertilizing pollen of its inferior brethren. It has been found that cultivation tends to bring out and make plainer the differences which have already appeared in a state of nature.

Now, as the character of a plant can only be changed by introducing a new element into its life, which alone controls its growth and habits, it is plain, that a tendency to vary towards any desired excellence, once commenced, will continue so long as the predisposing causes remain active. These causes may be an unusual stimulus given to a plant by an increase, or change in the quality and quantity of food, or any other conditions effecting its growth. It is also found that the domestication of trees of the same variety, in different climates, develop different traits, so that the grandchildren of the same tree are often so changed, that experts mistake their identity.

Our Old Standard Fruits—By this method of artificial selection and careful cultivation, the possibility of obtaining improved fruits becomes in time a certainty, but the process requires centuries of unremitting care and watchfulness, and is therefore very discouraging to the average short lived horticulturist. It is, however, the same method that has been unconsciously pursued for thousands of years in the elder civilized countries of the world. From times too ancient for record, man has selected and planted in close proximity the best obtainable varieties of fruit trees, and during all this time, their fertilizing elements have mingled and intermingled, undisturbed by that of inferior sorts. Perhaps, after long intervals, occasional seedlings of superior excellence were born and preserved. But as a rule, the advance must have been slow—an entire generation showing but slight improvement over the preceding. The state of advancement reached at any epoch is not recorded. But of this I am certain, the final out-come—the present excellence of our standard fruits, has not come by chance, nor accident. It is the result, just as much, as if carefully and intelligently planned and executed, of centuries of continuous selection and repeated crossings.

But unfortunately for us Iowans, these varieties though hardy, long-lived and fruitful in their native homes, are not adapted either in one or most of these qualities to our soil and climate. This fact compels us to begin at the bottom, as the ancients began, or to climb up by some other road. This paper is an attempt to show that there is another road, open, easy and sure. Science, multiplied experiments and many years of observation, are unmistakably pointing out the way and the how to attain the long-sought end in a comparatively short period of time. In the working out of this problem, we shall need these old familiar fruits, that gladdened our hearts and satisfied our appetites in our boyish days, and we may also need these newer Siberians and Russians, whose capabilities and disabilities have been the subject of much earnest discussion. Happily some of them will furnish the

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necessary new blood to mingle with our own acclimated natives, from which I hope the largest results. But the road is long at shortest, and it may require the slow work of several generations of crossings, before the dim morning light appears.

In experiments already made in this direction, many are disappointed because, though the resulting seedling trees are usually found to be strong and vigorons, the fruit is often inferior to either parent, reverting back to the wild nature. They forget that this result is in accordance with a well established natural law, that those trees that come the nearest to perpetuating themselves in their offspring, have the greatest vitalizing force when used in crossing with other varieties. The qualities transmitted by the one parent are the combined results of a long line of ancestors, all possessing exactly the same traits, while the qualities contributed by the other parent, are made up of many different opposing influences, that either weaken or destroy each other.

Plants possess the power, the same as animals of differentiating, or separating the food into different compounds, or different elements, for the purpose of building up the different tissues of the body. May not this fact account also for the differences, which are found amoung the seedlings from the seeds of the same fruit, or capsule of hybrid, or mongrel plants? May not the parent possess a like unconscious power of distributing its own characteristics unequally among its many seedling children, especially if one trait has been excited by some impulse, as would naturally be the case with cultivated plants?

The Cherry.—Substantially the same method should be pursued with the cherry, that I have here attempted to outline. But we shall probably meet with more difficulties than with either the apple or the plum, owing to the fact that we have no natives sufficiently promising to be used as one side of our cross. Perhaps adjoining States may supply the deficiency. Otherwise we may be compelled to begin with the small wild red variety, that seems a very poor foundation on which to build an ideal cherry. The foreign varieties are numerous and their fruit excellent, but they are generally short-lived; and strange as it sounds, with us, they are chary bearers. The fault is not in themselves, as was the case with two celebrated Roman Senators, but in our inhospitable climate. They persistently prepare their fruit buds regularly every summer, but in about three seasons out of four, a cold norther, following a few warm days in March utterly destroys the anticipated crop. The spring needs reforming. She is coy, treacherous and unreliable. One day she smiles with genial warmth and bright sunshine, the next she frowns with freezing breath and deadly embrace. While the philosophers and weather prophets are dealing with her, let us not intermit our efforts to raise a variety of cherry having an indolent, sleepy habit. It should be so constructed in thickness of bark, in number of scales on its fruit and leaf buds, or in some other way, that several days of continuous sunshine are required to arouse it out of its winter sleep.

With the materials at hand with which to begin and carry on the work, the result ought not to be uncertain, nor long delayed. Perhaps, if suffi-

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cient inducements were offered, an army of intelligent horticulturists might soon be enlisted, that would in a few years carry forward this work to a successful issue. To this end, I would favor the offering of a reward of, say $5,000, to any person who will by hybridizing, or by any process whatever, produce a variety of cherry, within the next twenty years, that will thrive on our prairies, prove long lived and prolific annual bearers.

There is one factor that is slowly entering into the problem, which it may be well to mention. The complete settlement of our State, as also the large States on the north and west, the prevention of annual prairie fires, the draining of swamp lands, and more than all, the extensive planting of forest trees, are gradually but surely changing our climate; and, I think, will assist rather than retard the work of improving our fruits.

One of my horticultural friends offers here the consoling remark: "These are nice and fine spun theories, but they lack the force of demonstrated facts. They are idle dreams, and you had better wait until you cross the river, before wasting any more time over them. This may be true; no one knows absolutely. But I possess, with the majority of you, I hope, a kind of Patrick Henry determination that bids me not wait that long. I believe it is a work set for us to do in this life, and if my efforts may assist, in the smallest degree, to remove any difficulties and clear up any doubts, connected with the solution of this most important problem, by so much, at least, will they push further out the boundary of human knowledge and help in the accomplishment of our appointed task.

DUBUQUE, IOWA, January 7, 1888.

GEO. VAN HOUTEN, *Secretary State Horticultural Society:*

DEAR SIR—I cut scions as follows on the 31st of December with thermometer at 45 degrees, and compared them with scions of the same varieties cut before cold weather. I class the injuries from No. 1 to No. 10, No. 1 being perfect.

St. Lawrence, No. 2; Fameuse, No. 2; S. Pearmain, No. 10; Alexander, No. 1; Ben Davis, No. 4; Antonovka, No. 1; Longfield, No. 1; Fall Orange, No. 1; No. 20, No. 2; Duchess, No. 1; Yellow Transparent, No. 3; Mann, No. 5; Ben Davis on No. 20, No. 2; Haas, No. 2; Tetofsky, No. 2; My Seedling No. 1, No. 1; Seedling No. 2, No. 3; Red McIntosh, No. 3; Pewaukee, No. 3; Walbridge, No. 2; Lombard plum on peach, No. 5; Lombard on native plum, No. 1; Shippers' Pride on Myrobolan, No. 2; Shippers' Pride on native, No. 1; Bassett on peach, No. 2; same on native, No. 1; Desota on peach, No. 1; Forest Garden on peach, No. 1; Russsian plum No. 2, No. 1; Arab, No. 1; Russian No. 19, No. 2.

The pears show no traces of injuries at terminal bud. Darkness prevented me from completing the investigation, and next morning the thermometer was below zero.

All of our trees shed their leaves in good time and went into winter quarters seemingly in good condition.

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I offer the above thinking it may be of use to the Society as a pointer to what we can expect of the present winter.

Yours truly,

W. H. GUILFORD.

EXPERIMENTAL HORTICULTURE.

BY O. A. KENYON, M'GREGOR.

Having been appointed by this honorable body to write upon this subject, I approach the task to fulfill a duty, rather than with the expectation of throwing any light upon it that will be of much practical benefit to the horticultural fraternity.

Experiments are conductted to discover some unknown truth, principle, or effect, or to establish it when discovered.

If all our present horticultural products were entirely satisfactory, three would be no need of and no call for experiments in this direction. But the human mind was not made to be satisfied. Had it been, it would never have emerged from a condition of barbarism. An essential requisite for experimental work, is an active intelligence, having a constant desire to possess, and exercising a constant effort to obtain something better than it now possesses. The mind directs the effort, while nature supplies the materials with which to operate.

These materials are scattered throughout the earth and atmosphere and it is only by uniting them in a proper manner that the results we desire can be secured. Now a want of the knowledge of the proper union, of the proper materials or agents, to secure the growth of just such horticultural products as we desire, is where our main difficulty lies.

In the planting of seeds of grains, vegetables, or fruits, the products of each will be such in kind as was represented by the seed. But new varieties are constantly springing up as the result of cross-fertilization. It is only the thorough-bred seed that will exactly reproduce itself in kind and variety. It is claimed by breeders of livestock that the thorough-bred is obtained by a long line of in-and in breeding, and the same is probably true of seeds, especially fruit seeds.

It may be well to bear this in mind, as the attention and experiments of horticulturists are now largely devoted to the production of new seedling fruits, and fruit-bearing trees and plants.

It is further claimed by some livestock breeders, that there is no such thing as a general-purpose animal; that the draft horse and the roadster, the beef and the dairy animal, should be bred exclusively for their respec-

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tive purposes; that the mingling of the blood of either, with others of its kind, but differing in variety, produces an inferior animal for either purpose; in other words, that the undesirable points in both are most likely to appear in the offspring. If this be true of animals, it may also be true of fruit seeds. In fact, the very large proportion of inferior, cross-bred seedlings produced, indicates that such is the truth. Hence, experiments in crossing fruits of very hardy trees, with superior fruits of tender trees, should be watched with especial care. It may be possible with such crosses that a long line of careful, intelligent in-and-in breeding will produce desirable results; that is, trees and plants of superior hardiness, producing fruits of superior quality.

As before said, experiments are conducted "to discover some unknown truth, principle, or effect," and horticultural experiments are looking principally to an effect or result; namely, a plant, vine or tree, and their fruits that shall be in all respects superior to any now on our lists.

The activity of experimentors during the last two decades, has nearly exhausted all known means for such improvement, or rather we have confined ourselves too exclusively to one or two well known methods, and neglected to use others, within our reach, that might prove of the greatest value. It seems to me we have depended too much upon crossing, and too little upon feeding. New fruits, or new representatives of our old fruits, possessing characteristics slightly different from their parents, have been mutiplied without number, while but very few of them have survived the critical tests to which they were subjected.

It is somewhat remarkable that many of our best fruit came (as it is said) by chance; that is, were found growing wild, or where the seed was planted by other than human agency. This suggests the inquiry, whether our experiments would not be more successful if we were to study and imitate the conditions under which such fruits sprang into existence. Another remarkable thing is, that in the improvement of our fruits, small fruits especially, we have failed, generally, to improve the flavor, the aroma, the boquet It is a common remark that cultivated berries have not the fine, delicious flavor of the wild ones. Our efforts have been directed to the improvement of those qualities that please the eye, as size and color, rather than to fine flavor. Our future experiments then should be directed to this point. I believe the flavor of our fruits may be improved by the use of proper fertilizers or plant food. We know that the flavor of our butter, cheese, milk, beef, pork, mutton, poultry, eggs; and, also, some vegetables, is largely influenced by the feed consumed by animals, etc., and why may not the flavor of our fruits, as well as the hardiness of plants and trees be effected by similar means. In conducting experiments to this end, there are one or two points that should be kept constantly in view. The first is that all plant life depends for its sustenance upon food derived from the earth and atmosphere. The second is, that this plant food does not consist of one single element or substance, but is composed of several elements acting upon and in harmony with each other, and then follows another point, that should be particularly remembered, namely: The suppression of one of these elements is suffi-

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cient to considerably diminish, or even annihilate the proper action of the others. Hence, the failure sometimes to raise good crops of fruits, vegetables, or grain, on soils apparently rich. There was some element lacking, which, if properly supplied, would have so united with those present, as to have forced the whole into an active condition, suitable for the proper sustenance, growth, and life of the plant, and the perfection of its fruit.

To illustrate: The good wife wants a plate of nice biscuit for supper. She mixes flour, buttermilk and a little salt, rolls and cuts into proper forms, and bakes. Result, a hard, soggy, unpalatable, indigestible mass, stimulating dyspepsia, and suggesting the saloon and divorce. Had she added a little mild alkali, as saleratus, before baking, she might with impunity have suggested to her lord her desire to possess that lovely ten dollar hat. Here the addition of a single element changed the results from a negative condition, or failure, to a positive one, or success. So, in my opinion, the results of many of our horticultural experiments depend for their success or fallure upon the presence or absence in the soil of the proper elements in their proper proportions. We hardly hear a lecture or read an article upon farming, gardening or fruit raising, without reference being made to the condition of the soil. Experience and observation teach us that unless the soil is supplied with the proper kinds and quantities of plant food, the crops, whether of grain, grass or fruit, will be a failure. Our past horticultural experiments have consisted mostly in cross-breeding of varieties or of individuals of the same variety. Now as none of our fruits (apples especially) are thoroughbred (according to the meaning of the term as given above), then I think the same rules will apply in experiments in improving them as obtain in experiments for the improvement of animals, that is, in crossing there is a constant tendency toward retrogression. As, then, we have only mongrel plants and mongrel seeds to start with, we must turn our attention to feeding their mongrel offspring, and see if we cannot find something in the way of plant food that shall develop new blood, new life, with that hardiness of tree or plant and excellence of fruit that we all desire, and for which this society has offered so very liberal premiums

It is true that in both animal and vegetable kingdoms prodigies have occasionally appeared, derived, so far as could be ascertained, from ignoble sources; but this fact should not tempt us to rely upon such sources for the production of our ideal fruits, or to relax our efforts or neglect any means that may seem to promise success.

It has been said that our fruit trees "freeze to death;" but I am inclined to think that they freeze to death only because they were first nearly starved to death. Other circumstances being equal, the half-starved animal is the first to succumb to the rigors of the climate, while the one fully fed with a well-balanced ration suffers but little from cold or storm. Will not the same rule apply to our fruit trees? The disposition and desire of a tree (so to speak) is to live, and if it can find in the soil a sufficiency of a properly balanced ration or food, will it not appropriate it for the purpose of sustaining and prolonging life and health?

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Five or six years ago I bought from Prof. Budd, three Montmorency Ordinaire cherry trees. Two of them were planted in my yard, in natural soil, covered with grass. The third was planted on the edge of a bank of earth thrown out in digging a cellar twenty years before. The first two have made a good growth each year, and have shown no signs of disease or injury from climatic changes. The third one makes a good growth, but kills to the ground every winter. My conclusion is that the subsoil on which it stands contains all the elements to induce a good growth, but lacks some element which, if supplied, would give it hardiness. You may ask, what kind of food or fertilizer is necessary to make a tree hardy and productive of the best quality of fruit? I answer that I don't know; but I believe somebody will find out, if the same energy and care is given to experiments in this direction that have been given to the feeding of our domestic animals for the development of particular points.

These views may be new to some, and may seem a little peculiar and perhaps even impracticable and visionary; but they are founded, in part at least, upon facts with which you are all familiar.

First. No intelligent nurseryman will raise two successive crops of the same kind of tress, (from grafts at least) on the same ground. Why? Because the first crop absorbs all, or nearly all of the particular kind of food, adapted to that particular kind of trees, and before it will grow another good crop of the same kind it must be replenished with proper food. Experiments are in order then to ascertain what should be supplied to the soil, to properly fit it for the immediate growth of another healthy and thrifty crop of thesame kind of trees.

Second. Young, thrifty trees, planted in orchard, in good soil, neither freeze nor starve to death, until they have attained considerable size, usually after they begin to bear, then weakness and decay set in, and the first change of weather, that varies a little from the average or normal, numbers them with their long line of predecessors. Now the fact that young trees thrive for a few years after being planted in good soil, shows that they find plenty of appropriate food there, and the presumption is, that the available proportion of proper food in the soil to the ever increasing requirements of the tree, are constantly diminishing, so that in a few years the trees begin to starve, especially during and after its exhaustive labor in the production of fruit. Experiments to ascertain what particular kind or kinds of vegetable or mineral food or foods, are necessary to perpetuate the healthy, thrifty conditions of our young orchards, open a wide field for intelligent study and investigation, to which the attention of the younger horticulturists is especially invited.

Those of us who have nearly completed our three score years and ten, can only suggest lines of horticultural experiment, any of which require nearly a life time to accomplish and leave their development to our younger brethren, hoping that with a knowledge of our success and failures before them, they may avoid the latter, and be inspired and benefited by the former. And that by an energetic and intelligent effort to achieve their ideal of per-

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fection, their hopes may be more than realized and their labors crowned with profit and honor to themselves, and benefit to their fellow men.

After placing this paper in the envelope, and before sealing it, I took up the "Orchard and Garden" for January, and the first thing that struck my eye was the following: "John Wilcox holds that starvation is the primary cause of disease in plants and trees."

OUR NATIVE PLUMS AND HOW TO IMPROVE THEM.

BY W. H. GUILFORD.

Well, I would recommend that we first collect the good natives of local reputation and submit the fruit to a committee of disinterested fruit growers appointed by the State Society, the fruitfulness and general characteristics of the tree to be given in writing.

2d. Establish at least two plum stations, for instance, one at Atlantic, and one at Ft. Dodge. Persons desirous of calling the attention of the society to the best plum should be required to forward to each station two specimen trees at least two years old, from bud or graft. This arrangement need not jeopardize the ownership of the variety; and if it prove valuable, the endorsement of this society would place it securely on the market, and the possession of the two best native plum orchards in the State would pay the owners of the land. We would like to submit a few varieties on the above conditions.

3d. Crossing the earliest of our natives with the earliest of the Wild Goose type. Plums cross very well, if the conditions are favorable, for a happy-go-lucky method. Set the trees so that the limbs interlace; let only one limb on each tree bear fruit, and those two limbs should be so arranged that their blooms come together; a limb should not be permitted to mature fruit two years in succession. This insures perfect flowers and plenty of pollen. All fruit developed in this way will be extra fine, and cross-fertilized specimens will probably show some markings, but all pits should be planted and fruited. Leaf indications are not always a safe guide. This line of experimental work could be carried on in the south part of the State when it is desirable to cross an early bloom on late. The early can be grown in a tub, and by a little care can be brought in contact at the proper time.

4th. The crossing of our best natives with the apricots, but the chances are that if we got a good thin-skinned variety the curculio would claim it. The Miner and Emerson are evidently thick-skinned hybreds of this parentage. I would like to suggest a cross between Forest Garden and Emerson; the latter is colossal in tree, and perfectly hardy; the fruit is large to very

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large, round, dark red, with a well defined suture; it is a regular bearer, but on the whole a poor bearer; it is undoubtedly unable to pollenize itself, and would cross promptly in its off years with strong pollen varieties like De Soto or Forest Garden.

5th. Mariana, Forest Rose, "Wild Rose," Wild Goose, Golden Beauty and all that class of plums can be grown farther north by working them on hardy stocks. Peach, Myrobolan and Wild Goose seedlings are not hardy enough. All of the above plums should be worked on stocks grown from native pits gathered in north Dakota or Minnesota. The tender scion should not be permitted to put out feeding or surface roots in central or north Iowa. A stock that will mature its terminal buds in ninety or one hundred days has a modified but corresponding influence on the scion when it becomes a stock. This is my experience after years of comparative tests —when the scion outgrows the stock. The union should be so near the ground that the moisture will assist the expansion of the stock. I am about satisfied that top working is unnecessary, and that a union at the collar serves the purpose not only in plums but apples, shrubs, etc., where it is expected to transmit hardiness from stock to scion. For our heavy natives, such as De Soto, Rollingstone, etc., peach is a good stock for Iowa. We must by all means plant seeds, cross-fertilize and produce all the good new seedlings we can, but our first duty is to *take stock* and see what we have on hand. We need plums covering a season of three months. They appear on our market covering that period, but the earliest and latest are in limited quantities. At the best plum exhibit I have seen in northeast Iowa DeSoto was No 2 in size and No. 3 in quality. Its competitors came from the Mississippi bluffs and along the Maquoketa, and the best was a small white plum that originated in Dubuque about ten years ago. Our most profitable plum is of inferior quality, but size and beauty give it a ready sale. I could give a list of about ten varieties of valuable plums in this county that have never had a scion taken from them yet, and only need the endorsement of some good authority to send them out and swell the list of right good plums. Along the Mississippi bluffs we have some fine natives, particularly in the vicinity of the mouth of the Upper Iowa in Allamakee county, where I have seen some fine specimens of the De Soto type, which leads me to think that the De Soto may be a native of Iowa. The finest in Dubuque county are along the Maquoketa bluffs on the escarpment of Niagara limestone, and I may say that our finest fruits succeed best along those bluffs and around Sherrill's Mound, where the disintegration of Niagara limestone forms the soil.

Grant county in Wisconsin leads us in apples and grapes, owing probably to the moisture rising from the Mississippi and its timbered bluffs being carried east by the prevailing winds.

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SPECIAL MEETING IOWA STATE HORTICULTURAL SOCIETY.

Pursuant to call of President C. G. Patten, the Iowa State Horticultural Society met in special session, in the Horticultural rooms in the Capitol building, Des Moines, at 10 o'clock A. M, September 7, 1887.

Present, C. G. Patten, President in the chair; Eugene Secor, vice-President; Geo. Van Houten, Secretary; several directors and about twenty other members being present.

The report of Col. G. B. Brackett, who had been appointed by the President to prepare the property of the Society and place same in place in the rooms was read by the Secretary as follows:

DENMARK, IOWA, Sept. 5, 1887

C. G. PATTEN, *President of State Horticultural Society, Des Moines, Iowa:*

MY DEAR SIR:—I herewith send you a brief report of my doing in the horticultural rooms at the capitol. By request of the committee that have these rooms in charge on the 28th of July, I proceeded to Des Moines and commenced to collect our property and arrange it as best I could with the fixtures that we now have in order to make a showing of what we need to display our specimen of woods and cuts. Of the collection of woods which I made at the Centennial Exposition, I found nearly all in the Des Moines exposition building though in a bad condition, the boxes having all been broken open and exposed to the dust and coal smoke. Those which I obtained at the New Orleans exposition, were in about the same condition. Many of the glass jars obtained from Guatimala and Venezuela, were broken, owing to bad handling and packing. One box of wood specimens is missing, but I am in hopes it will yet be found, also a large fine specimen of cabbage palm cannot be found.

The fruit casts that were exhibited at the Paris exposition and at New Orleans, were found in tolerable good condition, but those that were left at Des Moines were in deplorable state. They were packed in pasteboard boxes with partitions made of strong binders board, so that each specimen was in a separate apartment, these cases were put on edge in a wooden box holding twelve cases. When found in the basement of the Capitol, the box had been broken open, and instead of taking out the pasteboard boxes and

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getting at the contents, they were entered by breaking in the side or edge and tearing out the partitions, so as to get all of the casts. Many of them were broken and many of the finest specimens stolen, and the balance were crowded back into the cases with labels and broken casts in a heterogeneous mass. You can imagine my feeling. I did not attempt to express them in language for I could not do it justice. This loss is irreparable for many of the fruits from which these casts were made, are things of the past. I have only attempted to display a part of our specimens temporarily. The cases that they are in, are fit only for books, and there is nothing suitable for the wood specimens. For the casts and other things we need horizontal cases instead of upright ones. The under part could be utilized for the storage of surplus articles.

Plans and estimates of the cost of these and other fixtures needed should be made and presented to the next General Assembly asking for an appropriation to cover the expense, together with the amount already expended for the book cases in use and paid for by the Society.

There is a considerable work yet to be done in furnishing the pedestals for the casts (which you will find in one of the draws) and labeling them. The wood specimens all need to be cleaned and varnished, etc., etc.

This business really belongs to the committee on capitol rooms, but I make this hasty report for the benefit of the Society. Very truly,

G. B. BRACKETT.

On motion of C. L. Watrous the report was received and referred to Committee on Capitol Rooms.

Mr. Watrous stated that the rooms had been fitted up in pursuance of authority of last annual meeting.

The President stated that it would not be expected that he make an address, but a few thoughts might not be out of place.

In addition to the call of the Society to consult upon the establishment of of an arboretum, there are some other matters to which I desire to call your attention.

It seems to me that our Society has reached a point in its growth, when it should hold regular and well organized summer meetings. Premiums should be offered on fruits, flowers and vegetables appropriate to the season. A standing committee might be entrusted with arranging for and selecting the place for holding these summer meetings.

A well organized arrangement for these gatherings will enhance the interest in them, and add greatly to their usefulness.

There is another subject to which I especially invite your attention; namely, the three District Societies. Your are well aware that these societies are endeavoring to keep alive, and develop the interest in

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horticulture in their several fields of labor; that their territory is large, necessitating the traveling of long distances by many of their members.

They have no funds except that received for membership and by contributions, and that amount, used with the greatest economy only allows them to pay a single officer, their secretary, a very meager sum for his services.

A small annual appropriation by this Society to the Eastern, Western and Northern Societies, would place them beyond the mere struggle for existence that they now have, and make them powerful auxiliaries to the State Society.

A hundred dollars annually appropriated to each of these societies, would permit them to partially recompense their secretaries for their labor, and place them in a position to offer suitable premiums for the exhibition of horticultural products.

Such action by this Society, would result in widening and strengthening the interest in horticulture in all parts of the State, to a degree, that I doubt not, cannot be attained by the investment of a like amount in any other way. The funds of this Society are ample; the work is legitimate and much needed, and I trust that its importance will not be overlooked.

Capt. R. P. Speer moved that a committee of three be appointed on suggestions of the President to report at winter meeting.

B. F. Ferris: Something should be done at this meeting. The Secretary of the Northern Society has done about one hundred dollars worth of work, and has only been paid about ten dollars for the work.

Hon. C. L. Watrous moved that the Northern, Eastern and Western Societies each be allowed to draw $100 this year, and the further consideration be referred to a committee.

President Patten called Vice-President Secor to the chair, and spoke on the question before the house, saying that he thought this one of the most important matters that could come before this Society. These three societies represent the different parts of the State, and the members are at large expense in attending the meetings, and they have no money to pay premiums. County societies are different, there is but little expense in attending them.

Hon. C. L. Watrous: In our organic law we are bound to foster these societies; our appropriation has been doubled, and we can spare a little for them without interfering with our work.

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Prof. Budd: It is true that our appropriation has been doubled, but it was for a specific purpose.

Capt. R. P. Speer moved to amend by striking out $100, and inserting $50 in lieu thereof, and say that it shall be used for pay of Secretary.

Amendment carried, and motion as amended carried.

Capt. R. P. Speer, on part of a committee consisting of himself and Messrs. Silas Wilson and H. W. Lathrop, reported that in pursuance of an agreement, that he, (Mr. Speer) and Mr. Wilson had met Messrs. Wheeler and Shaffer, of the Agricultural Society. They treated us very nicely, and said we could have what ground we needed for an arboretum, and ground for a nursery on their grounds east of Horticultural Hall. The proposition was to let us have ten acres. We told them that we would probably want more than ten acres. They agreed to let us have ten acres for arboretum, and the temporary use of other grounds for nursery purposes. We now have money that we can use for fitting up such ground; as the large seedling premiums we offer can not begin to draw much of our money for some time to come. Of course this aboretum will cost considerable and we should carefully consider the matter. We will want a man who will carefully look after it, and constantly attend it. We will have to pay a man a salary and should have an industrious man. Part of ground should be put to strawberries, to be sold to help pay expenses. As to title, if the Agricultural Society should cease to use the ground, it would revert to the State. The Society will give us a contract so as to give us exclusive control of the part we are to use.

Prof. Budd: I do not see any need of speed. It will take a good while to make arrangements and get plants to start properly.

Motion by Prof. Budd that the subject of arboretum be referred to the board of directors, and that they report their action at our next annual meeting.

Motion by Geo. Van Houten: That it is the sense of this meeting that we accept grounds of the Agricultural Society for an Arboretum, in case suitable arrangements can be made—this to be done through the committee.

Hon. C. F. Clarkson: I think a decision should be made, and that as soon as possible, as part of the ground may be disposed of, and unless we decide to accept it, we do not know that arrangements can be made in the future. Grounds about here are becoming very valuable, and there will be very many calls for these grounds, and

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no knowing what disposition may be made of part of the ground. By accepting now, we can then take the necessary time to make our arrangements and begin operations.

Motion carried.

On motion of John Wragg, the same committee was continued, with the addition of four more to be added.

The enlarged committee is as follows:

R. P. Speer, Silas Wilson, H. W. Lathrop, Prof. Budd, C. L. Watrous, Dr. G. Hinrichs and A. J. Haviland.

Capt. Watrous moved that 3 o'clock be fixed as time, and Horticultural Hall on fair grounds as place, to meet to go and view the grounds for arboretum.

Carried.

John Wragg moved that a committee of three be appointed by the chair to confer with committees of Agricultural College and Agricultural Society, to make arrangements for institutes to be held during the coming winter.

Carried.

John Wragg moved that one hundred and fifty dollars, or so much thereof as shall be necessary, be appropriated to meet necessary expenses on the part of this society, in case institutes are held.

Carried.

The president appointed as committe on Institutes:

John Wragg, C. F. Clarkson and Eugene Secor.

Motion that property of the society in the hands of Prof. Budd, be placed in the society's rooms in the capitol to be in charge of the librarian.

Carried.

Motion carried that the secretary should be authorized to draw files of horticultural reports, to be official copies. These copies to be drawn from library, or where they could be obtained and to be turned over as part of the records of his office.

Adjourned.

GEO. VAN HOUTEN, *Secretary.*

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WESTERN IOWA HORTICULTURAL SOCIETY.

LIST OF OFFICERS.

PRESIDENT.

S. W. Wilson ..... Atlantic.

VICE-PRESIDENT.

W. K. Follett ..... Malvern.

SECRETARY AND TREASURER.

Geo. Van Houten ..... Lenox.

ASSISTANT SECRETARY.

L. O. Williams ..... Council Bluffs.

DIRECTORS.

Taylor county—R. G. Moen ..... Bedford.
Union county—Henry Jones ..... Afton.
Montgomery connty—T. E. Ellett ..... Red Oak.
Mills county—A. C. Sabin ..... Glenwood.
Pottawattamie county—A. B. Mair ..... Council Bluffs.
Cass county—R. D. McGeehon ..... Atlantic.
Harrison county—M. Pugsley ..... Woodbine.
Guthrie county—Richard Hopkins ..... Bear Grove.
Shelby county—J. B. Black ..... Harlan.
Sac county—L. J. Van Sands ..... Odebolt.
Page county—S. E. Field ..... Shenandoah.

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Adams county—Jacob Smith.....Brooks.
Fremont county—S. S. Orr .....Plum Hollow.
Dallas county—John Wragg .....Waukee.
Madison county—W. H. Lewis .....Winterset.
Adair county—L. M. Kilburn .....Fontanelle.
Ringgold county—D. N. Smith .....Lenox.

LIST OF MEMBERS.

R. S. Palmer.....Holt.
L. P. Trowbridge .....Ivyville.
S. H. Redman.....Villisca.
B. F. Cowgill.. .....Villisca.
W. S. Alger.....Villisca.
F. G. Watterman .....Villisca.
S. N. Phelps .....Woodstock, Minn.
L. A. Williams .....Glenwood.
J. W. Murphy.....Glenwood.
C. H. Dyer.....Glenwood.
M. G. Edwards.....Glenwood.
G. B. Van Horn.....Glenwood.
A. C. Sabin .....Glenwood.
M. J. Williams.....Glenwood.
R. Colbert... .....Cromwell.
G. W. Franklin .....Atlantic.
S. W. Wilson.....Atlantic.
Silas Wilson.....Atlantic.
Frank Hiatt.....Atlantic.
R. D. McGeehon .....Atlantic.
R. W. Carson.....Minden.
L. O. Williams .....Council Bluffs.
J. R. Rice .....Council Bluffs.
N. P. Dodge .....Council Blugs.
F. H. Bruning .....Kent.
Geo. Van Houten.....Lenox.
W. F. Davis .....Emerson.
Thos. Weidman.....Red Oak.
O. G. Howard.....Red Oak.
Chas Yale.....Rek Oak.
T. E. Ellett ... .Red Oak.
J. T. Stinson.....Red Oak.
B. F. Elliott.....Red Oak.

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C. T. Ford.....Red Oak.
John Hays.....Red Oak.
J. W. Lattimer.....Red Oak.
J. M. Taylor.....Red Oak.
E. C. Taylor.....Red Oak.
C. H. Lane.....Red Oak.
H. W. Kennedy.....Red Oak.
J. S. Shanahan.....Red Oak.
S. E. Field.....Shenandoah.
W. K. Follett.....Malvern.
Thos. Bonham.....Malvern.
Thos. Astrop.....Malvern.
Jacob Smith.....Brooks.
Henry Jones.....Afton.
R. Patrick.....Emerson.
A. F. Collman.....Corning.
J. H. Wallace.....Creston.
H. A. Terry.....Crescent City.
B. Harcourt.....Carson.

STANDING COMMITTEES.

It is hoped that each member will make notes during the season, so as to be able to make a full report at next meeting. Except local committee, each member will act separately and report on topic assigned.

Local Committee—A. S. Bonham, *Chairman*, A. B. Mair, J. R. Rice, L. O. Williams, T. P. Treynor and Mr. —— Wood, all at Council Bluffs.

Ornamentation of City and Village Homes—N. P. Dodge, Council Bluffs; S. Barnard, Table Rock, Neb.

Landscape Gardening—L. O. Williams, Council Bluffs; Silas Wilson, Atlantic.

The Grape—Varieties and Culture—A. S. Bonham, Council Bluffs; F. H. Bruning, Kent.

What Have We Learned New in the Nursery—J. R. Rice, Council Bluffs; F. W. Meneray, Crescent City; F. W. Taylor, Omaha, Neb.

Orcharding—J. H. Masters, Nebraska City, Neb.; W. K. Follett, Malvern.

Varieties and Behavior—Geo. Van Houten, Lenox.

Minnesota Horticulture—S. N. Phelps, Woodstock, Minn.

Crabs and Hybrids—Their Value—H. A. Terry, Crescent City.

Ornamentals—A. F. Collman, Corning.

Forestry—R. Colbert, Cromwell.

Strawberries—L. A. Williams, Glenwood.

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Raspberries and Blackberries—A. C. Sabin, Glenwood.
The Tree Pedlar—G. W. Franklin, Atlantic.
Marketing Fruit—J. W. Murphy, Glenwood.
Flowers—Mrs. L. O. Williams, Council Bluffs.
A Comparison of Horticulture with other Pursuits—B. F. Elliott, Red Oak.
Pruning—Jonathan Thatcher, Bonaparte.
Russians for Southern Iowa—Prof. J. L. Budd, Ames.
Horticultural Institute Work—C. L. Watrous, Des Moines.
Intensive vs. Extensive Work—L. O. Williams, Council Bluffs.
Valuable Varieties—Forest Trees—H. C. Raymond, Council Bluffs.
Influence of Stock on Scion—M. Pugsley, Woodbine.
Winter Protection—Practicability—R. D. McGeehen, Atlantic.
Experimental Horticulture—H. A. Terry, Crescent City.

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Western Iowa Horticultural Society.

TWELFTH ANNUAL SESSION.

RED OAK—DECEMBER 20, 21 AND 22, 1887—AT OPERA HOUSE.

Session opened at 10 A. M., with prayer by Rev. E. A. Leeper.

The president being absent, vice-President S. W. Wilson occupied the chair.

Geo. Van Houten, Secretary.

After renewal of membership, the Society adjourned until 1:30.

AFTERNOON SESSION—FIRST DAY.

Report of D. N. Smith, Director of Ringgold county, was read by the Secretary as follows:

REPORT FROM RINGGOLD COUNTY.

BY D. N. SMITH.

Our orchards in our county are just the same as everywhere else that I have been. Some have orchards in the best of style and others have now just a few trees planted and left out for destruction by the stock on the farm.

As to quality of trees and hardiness my Winesap and W. W. Pearmain, Roman Stem, Red Astrachan and Janet stand the best. Willowtwig, Ben Davis, Jonathan and Grimes' Golden are the most hurt by sun scald and borers or grub, as it is called. As to choice of quality and amount of

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fruit the Ben takes the lead. I gather more apples and finer ones, generally, than from any other. Next, W. W. Pearmain was so fine this year—much nicer than any I ever saw before. And that brings in mind my third reason for attending—was to bring samples of Pearmain, Janet and Walbridge. As Mr. Collman and Van Houten claim the Walbridge barren, I can report ten bushels from six trees, and the wind made havoc with them. My orchard is eleven years old and on clay subsoil.

The south part of our county is near a total failure, while the north half was near a full crop. Blackberries a failure last year; strawberries one third crop. I have Stayman's blackberry, but I consider it about worthless, as I have had it four years, and got it in a $20 bill of goods from a tree peddler, and I always get an eye tooth cut with those fellows. Ninety cents worth of red cedars from Mr. Bruning have been more benefit with less attention, and made a wonderful growth, than the twenty dollar's worth of peddler's goods. *Look out for them.*

In grapes the Concord is ahead, with Rogers' No. 15 second best and of fine quality.

As I am a novice please excuse mistakes.

DISCUSSION ON REPORT.

Geo. Van Houten: Horticulturists will recognize the fact that Mr. Smith is a farmer and not a specialist in horticulture. He speaks of W. W. Pearmain and Ben Davis being hardy. We know these varieties are generally proving very tender, but some peculiarity of soil or location enables Mr. Smith to succeed remarkably well, as may be seen by samples of fruit on our tables.

S. W. Wilson: How about Walbridge? it has generally been condemned.

L. A. Williams: I had ten bushels this year from three trees twelve years old. They cast their fruit some.

S. W. Wilson: They were as full as anything with me, except Janet.

Geo. Van Houten: I used to raise the trees and sell them, as they were good in nursery, and came highly recommended; but although thousands of them have been set, I never saw a peck of the fruit at one time until this year; while Jonathan, Ben Davis and others have paid well, and notwithstanding that Walbridge is hardy, I would not advise any one to set it.

Report of J. M. Russell, Adams county, was read by the Secretary, as follows:

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REPORT FROM ADAMS COUNTY.

BY J. M. RUSSELL.

The past year has been another hard one on fruit generally. The spring started favorably, to appearance, with showers and reasonably good weather, and our trees put forth an abundant bloom. On May 3d was frost and ice half an inch thick, which killed a great deal of the bloom and apples that had just set. The bloom that came after that did well.

In most of the orchards heard from the Jonathan was a failure, and the trees are dying badly, also Ben Davis, while in others there was a fair yield of fruit. The Maiden Blush, Lowell and Dyer were full, and for winter apples the Janet took the lead, while there was about half a crop of Winesap, Willowtwig, etc.

I have not noticed as much blight as for a year or two past, but the hot, dry fall appeared to cook some of the fruit on the trees and caused it to not mature naturally, and the consequence is that they did not keep very well.

In regard to Russian varieties, there are a few set out but have not come to bearing. The trees look well and thrifty.

Cherries were a failure generally, while the raspberry made a fair yield. The blackberry also failed to mature, but they set very full. Strawberries bore a full crop. Grapes were good, the Concord ahead, with other varieties to follow. The Oporto is highly recommended by Jesse Homan as *the* grape for late fall. He says let it have its natural way on fence or trees and you can have grapes till they freeze up.

The evergreens are gaining favor rapidly, and every farmer ought to put out more of them; while forestry is on the increase here generally, and every farmer is starting groves of different and mixed varieties.

L. A. Williams: I would like to know if drouth was peculiar to the two counties from which reports have been read?

Geo. Van Houten: As I reside near these two counties, I can answer for them, as no one is here at this time from either Adams or Ringgold. Since the 13th of April, 1886, we have had no rain to wet subsoil, and for several months at a time, during growing season almost no rain at all. The only wonder is, that with such drouth and heat, we could raise any crops or fruit. Most of the showers that we did have were local and often very narrow.

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S. H. Redman: On part of my ground, not cultivated, berries dried up badly. Where well cultivated the berries did well.

S. W. Wilson: Berries were a failure in many places with us. On north or east slope less damaged. On south or east slope they were almost a failure. We think in February the warm sun injured them more than drouth.

Acting President Wilson announced the following committees:

Fruit display and premiums.—L. O. Williams, R. Colbert, O. G. Howard.

Resolutions.—Silas Wilson, G. W. Franklin, L. O. Williams.

Nomenclature.—L. A. Williams, B. F. Elliott, F. H. Bruning.

L. O. Williams read a paper entitled Our Market for Small Fruits, as follows:

OUR MARKET FOR SMALL FRUITS.

BY L. O. WILLIAMS.

I have taken the liberty to turn the subject assigned to me, viz.: "Small fruits for market," around, and view it from the opposite standpoint. The subject from this point of view seems more inviting to me and one which needs attention.

The important query with the small fruit grower in this day, when berries are so abundant, is "where shall I market my fruit?" To begin with, a person entering the business should choose a location as near as possible to a good market. The extent of the plantation should also be governed by the demands of the market.

Our small towns can easily be supplied by a single grower, and any excess of growers must find a market for their berries by shipping to larger towns.

Now, the shipping business with our present high rates of express for short hauls is very unsatisfactory. From Glenwood to Council Bluffs the rate is 40 cents per 100 and 60 cents to Omaha. With a load of 1,000 pounds or more, it is cheaper to haul by wagon, but twenty miles' drive in the night is never an agreeable task, and it becomes in time quite monotonous and frequently very unpleasant. These have been the urgent reasons for my change of location the past spring. I was fortunate enough to secure my land the fall before at $50 per acre. The same land could not be bought to-day for less than $100; but I believe in the end that land within three or

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four miles of a good market is a better investment to the small fruit grower at $100 than land at $25 twenty miles distant. To illustrate this point, I would not swap my 15 acres at this location for 60 acres at my former location.

Council Bluffs and Omaha are the two great distributing point for Western Iowa and Eastern Nebraska, and with their rapidly increasing populations are fast becoming great centers of fruit consumption. The country for twenty to thirty miles around sends its small fruit into these markets by wagon and express, while the great berry growing districts of Southern Illinois and Missouri sends car loads of berries in competition with the home grown fruit. Now while there is occasionally a glut in these markets on account of these heavy shipments there is always a demand for choice, home-grown berries, and since the shipping facilities are unexcelled the surplus of fruit is soon distributed to outside points.

While much of the fruit grown in Mills county finds its way direct from the grower to Lincoln and smaller town in Nebraska and some even to Denver and Cheyenne; yet, Council Bluffs and Omaha being the nearer and larger markets receive the bulk of the berries shipped from this part of the State. The advantages of the "home" market to the grower are manifold and can not be enumerated in this paper. The nearer the grower arrives in supplying the consumer directly, the larger and more satisfactory are the returns of his industry.

The distant growers and shippers not only have distance to contend with, but dishonest as well as honest dealers and commission merchants.

Now, while a strictly honest commission man is comparatively hard to find, I believe that much of the dissatisfaction which growers experience from dealing with them, does not arise from dishonest returns so much as from lack of confidence and unfair dealing on the part of the grower. The commission merchant, to do well by the grower, should not only have regular consignments but the undivided patronage of his consignor. The grower who sends only occasional consignments, and these at a time when there is no other demand will be sure to be disappointed with the returns.

Lastly, we need cooperation among our growers. There should be a sort of Trades Union formed at every point where there are two or more growers. Among the business advantages of such a union may be mentioned those of ordering berry boxes and baskets together, thereby insuring uniformity of size and style of material, as well as lower prices and cheaper rates of freight. There should also be a uniform price paid to berry pickers, and an agreement as to prices of produce to dealers as well as to the consumer. There is a move being made among our fruit-growers and gardeners of this city to organize a County Horticultural Society, mainly for the benefit of protection to each other in establishing a uniformity of prices for produce of all kinds.

In union there should not only be strength but order and fellowship, and there are other christian graces which may be better cultivated through such a union.

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L. A. Williams: I do not like what he calls, in his paper, the unfair dealing on the part of the grower. The burden of blame should rest with the commission men and not with the producers. When we put our fruit into the commission man's hands, we throw our pocket book into his hands. For example, I sent a car load of 155 barrels of apples to a commission man, and only got fourteen dollars. net. He put them in the cellar, and put a car load of Michigan fruit on top of them, and after they were all sold mine was bought up, and were in poor condition, and I had to stand the loss, as the fruit went to the peddler. Another lot of one hundred dollars worth was lost as the commission merchant broke up and left. While I would not say that all commission men are rascals, I do say it is hard to find one honest one.

L. O. Williams: I did not mean to throw burden of blame on the producer. I say it is hard to find an honest commission merchant, but the growers should assort more carefully. Some use a commission merchant as a last resort, and only when they have a surplus that cannot be disposed of any other way. A regular supply of well assorted fruit should be sent, and all should be sent to one man, as you do not want to compete against yourself.

Geo. Van Houten: Commission men have a habit, or at least some of them, of sending reports when prices are high, and when prices run low you can hardly get a report from them. When prices run below a certain figure I refuse to sell untill prices advance. If markets are kept fully supplied prices sometimes fall below the cost of production, but this does not worry the merchant, as he gets a certain per cent for sales, and the lower the price the greater the consumption. Fruit growers should combine to keep prices from falling ruinously low.

Silas Wilson: Where fruit growers make a success they have organization. At Denver the producers watch the markets, and when they become flooded they take all the fruit out of the market, before it becomes stale, and get cost out of it, for jelly and other purposes. Where fruit growers are as numerous as at Council Bluffs they could organize and do something of this kind, and save themselves from loss. When markets are over-stocked, and fruit is stale, the consumption is not nearly so great, as when the berries are in good condition, even at a higher price.

L. A. Williams: If any one can suggest a plan, would like to hear more talk about it. The trouble is that St. Louis can send berries by

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the car load, and such towns as Council Bluffs and Omaha become distributing points. New York grapes can be sent there, and last fall ten pound baskets sold as low as thirty cents. I think we should as far as possible get in direct communication with the consumer.

Geo. Van Houten: If combination will not pay for selling fruit, it will pay in buying boxes and packages. The difference in price of boxes and crates, between retail price, local freight and wholesale price at car rates, often amounts to the profit of the grower.

L. O. Williams: Since our Society has declared in favor of one kind of box, I think it well to discuss that matter also. Illinois and other growers use the liquid measure, while we have been using the dry measure, which is about one seventh larger. I think the Halleck wine measure quart box should be adopted as the standard.

L. A. Williams: I do not see, Mr. President, how we can do that; we want to buy where we can get the cheapest, and, besides, styles may change. The new shallower box I consider an improvement over the Halleck box. The new style are easier made, and the box being broader and shallower, the fruit carries better in them.

J. W. Murphy: Last year I bought forty dollars' worth of box material in Michigan. The freight was thirty-three dollars. This year we bought by the car load, and fifty-two dollars bought twice as much material, and my share of the freight was nine dollars. If I had bought alone, the freight would have been about sixty dollars instead of less than ten dollars.

R. Colbert: As to size of box, the purchaser will not pay any more for dry measure than for liquid measure. Grapes sold this year at two cents per pound. It seems to me that if we could have a man to sell direct to the consumers, we could not only save commission, but the work could be done in a more satisfactory manner.

S. H. Redmon: I used large or dry measure box until last year, and could not sell any better, or get any more for them. Three of of the large boxes weigh about as much as four of the liquid measure box. I found I was being used up by using large box, so I was driven to using the liquid measure box.

S. O. Williams: I have always held to large size; thought it more honest, but the loss to father and I has been not less than one thousand dollars, as we had to sell in competition with the smaller measure.

S. E. Field: What we want is uniformity. We cannot induce others to use large size, and we should, in self protection, adopt the

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size most in use, and the size we have to compete with in market. Some farmers come to town with berries in baskets and buckets, and of course have to sell at low prices; then the merchants want us to sell at those prices. Think we should put our fruit up in good shape and try to get reasonable prices for it.

The berry box question was referred to the following committee: R. D. McGeehon, S. E. Field and W. F. Davis.

The Secretary read a paper from H. A. Terry on New Small Fruits of Merit.

NEW SMALL FRUITS OF MERIT.

BY H. A. TERRY, CRESCENT CITY.

In writing out a list of new small fruits, I will preface my paper by stating that my personal experience with these varieties has been somewhat limited, although I have a few plants of all the varieties in my experimental grounds. As the strawberry is the first fruit of the season, we will make it the first in this list.

Bubach's No. 5.—This variety originated with J. G. Bubach, of Illinois; and is one of the most promising sorts so far, that we have. The plant is a very strong grower, throwing up fruit stalks like miniature trees and producing fruit of enormous size and fine quality. It is very hardy and productive so far as tested.

Jessie.—This a Wisconsin variety and from the amount of advertising it has received, must certainly be a valuable sort. It seems to be a good one, though I have not fruited it.

Parry.—This variety comes from New Jersey, where it has acquired a wonderful reputation, though I hardly think it will do as well here in the west, unless it is on a sandy soil. It grows well here, but does not bear as well as it ought to. In sections where the soil is sandy, I would strongly recommend its trial.

Connecticut Queen —This is a real Yankee, and seems to adapt itself to almost any soil or situation. It is not a new variety, but is new here in the west, and I think is worthy of extensive trial. The fruit is large and of fine quality.

Belmont. This is one of my favorites. It is one of the best varieties to grow for family use. The fruit is very large, and is necked so that nearly all the berries are hulled when picked. This detracts from its value as a

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market berry, as the calyx should be left on the fruit when picked for market.

RASPBERRIES.

Among our newer raspberries I will mention two varieties that are not really *new* but they should be planted by every person who desires good fruit and plenty of it. These are Cuthbert and Shaffers' Colossal. The Cuthbert is in the old Antwerp family, and is quite hardy in central and northern Iowa, and is so productive, and the fruit so large and so good that I shall not hesitate to recommend it.

Shaffer's Colossal is the queen of raspberries. The fruit is very large of a purplish red color, and is probably the finest berry for canning that is grown. It is also excellent for table use when "smothered with cream." The plant is hardy and a strong grower with the habit of the black caps, that is, rooting from the tips, but never sprouts from the roots like other red varities. It has also the peculiarity of bearing a second crop in September, on the current years canes.

Caroline. This is a yellow variety and may be a cross or hybrid of red and black, as it is propagates in both ways, rooting from the tips and sprouting from the roots. The fruit is of good size and fair quality, and sells quite as well as the red, in fact is often taken in preference. It is quite hardy and very productive.

Beebe's Golden.—This is another yellow variety in the black cap family, and is a strong grower and very productive. Fruit is large and of better flavor that any of the old yellow sorts. It is not liked as well generally as the black varieties, but is very fine for canning, and is well worthy of cultivation.

Nemeha.—If Shaffer's Colossal is the queen of raspberries, the Nemeha is king. This variety originated in Nebraska several years ago, but for some cause had to go back east into "yankee land" to get up a reputation. In appearance, the plant and fruit resemble the Gregg, and it is doubtless a seedling of that variety. In hardiness, it is perfect, as I have never known a shoot to be injured by the winter. In productiveness it excells any other black cap, the fruit being very large and produced in enormous clusters. I have no hesitation in recommending it as the best black cap in cultivation for market.

CURRANTS.

Lee's Prolific is rather a new variety with black fruit, the color of which might detract from its value, still it is a fine variety for canning for winter use. The fruit is quite large, and produced in great quantities.

Wilder.—This is a new red currant that originated in Indiana, and which proves to be a fine grower and very productive. The fruit is large and of good quality.

The wonderful Fay's Prolific that we have all heard of, I think has been advertized to death, as it will neither grow nor bear fruit in western Iowa.

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There is no new goosberry of merit that I am aware of. I have tried the Industry and Triumph, and both have proved worthless. They may however do better in other localities.

BLACKBERRIES.

Stone's Hardy and *Western Triumph* are both rather new in this vicinity and both are hardy and productive, and fruit is of good quality, but perhaps no better than the Snyder.

GRAPES.

The new varieties of Grapes of high merit, (if we can believe all that the originators tell us) are so numerous that I shall be compelled to skip a good many of them, but will refer to some of the most worthy among which I may mention the Worden which has been fruited here in the west several years, and proves one of our most valuable varieties. The plant and fruit is somewhat like Concord, but fruit is thought to be a little better in quality than Concord, and the vine is perhaps a better bearer and quite as hardy.

Moore's Early. This fine variety is not quity as strong a grower as the Worden, but the fruit is larger and finer in quality. This variety ripens about two to three weeks earlier than Concord, and for that reason sells for a better price in the market. The past two or three years, the fruit of Moore's Early has sold for about double the price of Concord. The clusters are smaller and it is not quite as productive as Concord, but it probably pays as well to grow it.

Elvira —Six years ago at one of our meetings the members made light of my recommending the Elvira Grape for market, but I find that it is now grown quite extensively for that purpose and that it pays better than the Concord, as it brings a higher price in the market. This grape is perfectly hardy and wonderfully productive, producing its fine, round, compact clusters in great abundance. It is not a fine table grape, but is excellent for canning and for all culinary purposes.

Other new varieties of grapes are *Niagara*, *Empire State*, *Cottage*, *Mason's Seedling*, *Etta*, *Woodruff's Red*, *etc.*, but my personal knowledge of these is so limited that I do not care to risk an opinion of them at present. Most of these varieties are in the hands of competent horticulturists in our State, and will be thoroughly tested in the course of a few years.

R. D. McGeehon: I raised the Beebe Golden raspberry for years, but could not sell them. The last year I could not get pickers to pick them for all the fruit. They are the meanest, most worthless of anything I know.

L. O. Williams: There are objections to the Shaffer. It kills back sometimes, but new growth will, in that case, bear a partial crop.

R. D. McGeehon: I have had the Shaffer since it was introduced.

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With me it has never killed so as to fail to bear; it has borne more than anything except the Ohio. Some canes of Shaffer that were bored with the snowy tree cricket bore from the new canes. Shall cut some down in the spring to see how much they will bear. Think they will bear two-thirds as much as from old canes.

Geo. Van Houten: If tips are made to grow in fall, and left until spring, the canes will not winter kill. Even the Gregg will stand our severe winters when tips are well rooted and not removed until spring.

R. D. McGeehon: We always leave tips until spring, yet some winters the canes kill. Mr. Van Houten lives farther south, and of course canes do not suffer as much.

L. O. Williams: What shall we do about Fay's currant; Mr. Terry says it does not do well?

Silas Wilson: I think Fay's currant gives general satisfaction. It is very much like Cherry currant in fruit and leaf. In foliage it does not come up to Victoria. It is more liable to rust than Cherry or Red Dutch.

R. D. McGeehon: I think the Victoria better. The Fay may be a trifle larger than Cherry, but otherwise there is nothing remarkable about it.

L. A. Williams: My experience has been about as Mr. McGeehon's, but I have not lost faith in the Fay. It seems slow to develop, but it is head and shoulders above Cherry. I think the Elvira Grape a grand humbug.

R. D. McGeehon: Victoria is the currant for the money. I can raise strawberries that I like, but some of them cost one dollar per quart. So Crescent will do me.

S. W. Wilson: The Fay currant has been advertised and puffed very highly, but it cannot come up to the recommendations.

Reports of Directors of Madison and Harrison counties read as follows:

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REPORT FROM MADISON CONNTY.

BY W. H. LEWIS, DIRECTOR.

The year just closing has been with us one of extreme drought. Planting of the usual careless sort resulted in almost total loss, though a few careful ones have met with a fair degree of success. The season has been well adapted to the growth of seedling evergreens and careful planting of young trees has been satisfactorily successful. Strawberries ripened just in time to catch a shower, and gave a fair crop of good quality. The Crescent, Wilson, Sharpless, Downer's Prolific and James Vick all did well. Jessie did not fruit with us and seems a little tender under the extreme heat of summer, but not to so great a degree as Jewell. Bubach No. 5 seemed to luxurate in the blazing heat and promises well. Raspberries gave two fine pickings and then yielded to the extreme heat and drought. The only varieties I had were Tyler and Ohio. Tyler seemed to do a little best, but I think only because it was earliest. Blackberries were nearly a fallure. The few we had were Snyder; all others failed entirely so far as I can learn. The Concord grape gave us a good crop of best quality, and a few good Martha and Delaware were grown. Apples with us were a very short crop, and the winter apples were largely Romanstem with some Willowtwig, Janet and Winesap. The other winter varieties mostly failed, and the fruit from these is ripening prematurely and not keeping well. Of summer and fall varieties of apples we had a fair crop; trees of these kinds having endured the severe winters lately better than the winter varieties. The recent unfavorable seasons have destroyed many of our bearing orchards, and a sort of a craze seems to have set in for planting something hardy.

Many trees have been set which have been recommended by the sellers as hardy, and probably possess no other good quality, if indeed they are hardy. I am of the opinion that in the near future many of the planters will realize that "men do not gather grapes of thorns," or apples either for that matter. It seems unfortunate that so much importance has been temporily attached to the feature of hardiness, to the utter disregard of all the other equally important conditions and factors of the problem, and that so many trees are being planted of varieties whose value in this part of Iowa is at present only a matter of conjecture. It is undoubtedly best to experiment and to try new varieties of probable value, but it is too hazardous to make our entire plantings of this character.

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FROM HARRISON COUNTY.

BY M. PUGSLEY.

The apple crop of the past season was as large as we have ever raised. The severe winters of the last few years have injured, and even killed many trees, especially where growing on unfavorable soils. There is not a Ben Davis (root-worked) left in my orchard. Jonathan, Winesap and other sorts of like hardiness are sharing the same fate. Orchards on high lands are doing better, but many trees are failing even there. The Sheriff has done notably well this year. Russians, so far as they have fruited, are early apples, however, they may make a better record another year, as nearly all kinds of fruit ripened from two to three weeks ahead of the season.

The hardy stocks top-worked with Ben Davis and other of the semi-hardy sorts stands very well and are fruitful.

All sorts of plums have borne well. This is the third successive crop of Minero that I have raised, and no other sort near it for a fertilizer.

The grape crop was very good. The season was too dry for strawberries. Raspberry vines were killed worse than usual. Tyler as hardy as any. The Snyder winter-killed. Stone's Hardy injured and do not promise to be fruitful.

The farmers would be greatly discouraged were it not for the tree agents. They can always show just how it all came about and how to avoid like calamities in the future. They are making a great run on budded trees. They say a grafted tree rots at the union of the graft, and the rot spreads through the entire tree, producing what is known as black-heart. Comments unnecessary.

Evergreens are doing well in spite of drouth and cold. Scotch pine, White Spruce, Red Cedar of the Platte are all very reliable. Norway spruce is fine, but is liable to winter-kill if set in nursery row when small. The Balsam Fir make beautiful trees while young, but the oldest trees are beginning to have a shabby look. However, I would plant them for the twenty or more years of pleasure that may be enjoyed in beholding them.

Motion by R. D. McGeehon, that we recommend planting seeds of Snow apple, to be used as stock for budding.

R. D. McGeehon: I made the motion to get up discussion. You will see when I read my paper, on condition of orchards in Cass

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county, that one man recommends this plan. It is said to be a preventive of black heart. The theory of the tree agent is that budding prevents black heart, but I cannot see how it does it.

W. K. Follett: I have given this subject some attention, and I think I am onto the racket. I think nurserymen will not agree with me. Think it originated in the scion. In May and June rank growth ensues, and then blight comes, and these branches throw out suckers. Nurserymen come along and take those water sprouts off and make grafts of them, and of course they make diseased trees. The disease brought down from the top blight. In our work we are retrograding, and I think this is the trouble in the whole business.

L. A. Williams: I would like to ask Mr. Follett if he thinks a large number of the orchards are grafted from water sprouts?

W. K. Follett: Yes, I do.

L. A. Williams: I think that water sprouts will not bear as well, but I never practiced it. Never used water sprouts, and did not know that nurserymen did to any extent.

Geo. Van Houten: The idea that black heart comes from using water sprouts cannot be true, so far as that being *only* or *principal* cause. I never used water sprouts, and have had whole rows of trees with black heart. The orchards being set are not from water sprouts. For example, what would Mr. Lake do getting water sprouts to put up half a million grafts per year? All the water sprouts in Iowa would not be enough; besides the water sprouts being of a tender, succulent growth, the first severe weather of early winter kills or damages them so they will not grow if grafted. So even if they made as good trees nurserymen would not use them, because of the great number that would fail to grow. I think late pruning has more to do with black heart than any other one cause; but hard freezing, damage by hail or other causes may operate to cause black heart.

L. A. Williams: I would like to hear the top working more discussed. I would like to try it, and want to know more about it.

Geo. Van Houten: There is no doubt but what certain desirable combinations could be made, if we only had more knowledge on the subject. If parties will refer to back numbers of our reports, they will find very valuable reports of the experience of such men as Messrs. Pugsley, Lathrop and others. The experience of Mr. Pugsley is very valuable, as by setting rows of trees of specified kinds, and then in top working he crossed these rows; so that he had many

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combinations. The Transcendent, as a rule, has failed as a stock. Most of our American varieties of apple do not give satisfaction. Tetofsky, Whitney and Duchess do pretty well, and Tetofsky does well on a greater variety of stocks than most varieties. Prof. Budd informs us that Grimes Golden does well on Winesap. In theory the Winesap would be a poor stock, and perhaps would prove so for most varieties, but experience, which is more valuable than theory, shows that it is a success when used as a stock for the Grimes. I believe in top working, but the ordinary trees of our orchards are not suitable for stocks, and suitable stocks can only be had by root grafting. Suitable seedlings cannot be had, and even if Snow apple seed is planted we have no assurance that the seedlings will be hardy, or congenial to the variety we wish to graft on them.

R. D. McGeehon: I would like to ask Mr. Van Houten as to budding.

Geo. Van Houten: Budding is no better than grafting, and can not be applied so well. Budding to succeed best, is done near the ground, but has not the advantage of grafts, as roots cannot start from the budded stock, and if the seedling freezes to death, of course the top must die. In spring of 1874 I had thousands of trees that tops would have done for scions, while the roots were frozen to death. These trees were in nursery, and even such tender kinds as Ben Davis, wherever they rooted from the scion the trees lived, thus showing that even our tender kinds are more hardy than seedlings. The best way would be to use long scions of hardy kinds on short roots, set deep, so they will root from the scion; then after these hardy trees get up to proper size—say two years of age—top graft with desired kinds.

Silas Wilson: Agents sell trees budded on French crab roots. They tell this story because people generally suppose crabs to be hardy. Our ordinary kinds are, but the French crab is not hardier than the peach. Root-grafting, in my opinion, is the only way a reliable tree can be grown. I don't care if the pieces of roots are no more than two or two and a half inches long. I use long scions and expect to get roots from the scions, when if of hardy kinds the tree will be hardy, regardless of the original root. As to planting seed of Fameuse, we have no assurance that the seedlings will be hardy. The agent will tell the farmer that a tree to be hardy must be grown from a whole root; that without a tap root a tree cannot be hardy; but while this is a very nice theory it is not true, as in any kind of nursery work it is almost impossible to preserve the tap root.

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S. E. Field: Do not some varieties root from scions very much more easily than others.

Silas Wilson: Yes, some varieties root the first year, while others do not form many roots for several years.

Geo. Van Houten: That is one reason why pieces of roots are used. The shorter the root on which a scion is grafted, the more certain is the scion to emit roots. Two to three inches is enough to start a scion, and after well started the scion is more apt to emit roots than if on a whole root.

Motion lost by a unanimous vote.

EVENING SESSION—FIRST DAY.

Mr. Williams was asked to say something about fruit houses.

L. A. Williams: The main requisite of a good fruit house, is to have it so constructed that the temperature can be kept as near 33° as possible. Mine is built half underground, fronts the north, hollow wall, thirteen inches thick, braced by ties, ventilation from the bottom; cement floor, basement ten feet high; size of house 34x44. I have never prepared cold storage and have no practical experience. In summer time this house is cool, perhaps temperature about 40° when 80° outside. It is nearly frost proof.

B. Harcourt: I think it well for this Society to put itself on record as to budded fruit.

Silas Wilson: The State Society last winter passed a resolution on this subject. This was done because of the frauds perpetrated on the people. I move that a committee be appointed by the chair to draft resolutions expressing the sentiment of this Society on the question of budded trees.

Motion prevailed.

Committee—Silas Wilson, Jacob Smith and B. Harcourt.

The Citizen's Committee of Red Oak invited the Society to a banquet prepared at Hotel Johnson. On motion, the Society proceeded to Hotel Johnson, where a very pleasant evening was spent. The following short account is clipped from the Montgomery County *Independent*.

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THE BANQUET.

At the close of Tuesday's session, a banquet was given the association by the citizens of Red Oak, at the Hotel Johnson. The feast, of which eighty persons partook, was a sumptuous one, and does ample credit to the skill of the caterer. After the edibles were disposed of to the satisfaction of all, Col. Hebard, upon the part of the citizens, with a few happily chosen words, welcomed the members of the association to the city.

Hon. Silas Wilson, of Atlantic, responded in behalf of the association.

He was followed by Mr. Van Houten, of Lenox, who evidently came "loaded;" for he not only made a long and good speech, tracing the birth and growth of the association; their laudable undertakings and their beneficent results, but recited a poem, which could not have been extemporaneous. Mr. Van Houten displayed a familiarity with the muse quite remarkable for a practical horticulturist.

Our genial senator-elect, next responded to a call for "Weidman!" There is a joke on the senator to the effect that, in an open air tariff effort, before a bovine audience, he uttered such sentiments that his quadruped auditors unanimously "bolted;" one being in such suicidal haste that he precipitated himself upon a fence post, with the effect of becoming an immediate subject for mortuary honors. Weidman said that, fearing a like result, he would quit short.

Rev. Leeper related some horticultural experience of his boyhood.

Rev. Edson made a glowing speech, pertinent to the occason.

Rev. Austin, among other good things, got off a new gag on Adam and Eve.

Mr. Field discoursed at some length upon the berry box mystery, explaining that all boxes hold a quart, according to the system of measurement, but most growers use the liquid quart. The association declares itself in favor of dry measure.

At the conclusion of Mr. Field's remarks, the company arose from the table, and soon departed.

To the committee on arrangements, Messrs. F. M. Byrkit, C. C. Platter and M. N. Spencer, is due the gratitude of both the citizens and the association for an occasion that all will long remember.

SECOND DAY—MORNING SESSION.

President announced the remaining committees as follows:

Resolutions—Silas Wilson, G. W. Franklin and L. O. Williams.

Fruit and Premiums—L. O. Williams, R. Colbert and O. G. Howard.

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Nomenclature—L. A. Williams, B. F. Elliott and F. H. Bruning.

Experimental Horticultural Work was on programme.

Hon. Silas Wilson; I have no paper prepared on this subject. In fact the subject is discussed in most of our papers, and treated of more or less in most of our discussions. If I should write on this topic, it would simply be my individual work, as a large part of it has been experimental in character. The failures and successes are apparent to every one who is a close observer, or who reads our reports carefully. Taking this view I have not thought it necessary to prepare a paper and do not care to make an extended talk on the subject.

A paper by F. H. Bruning on Experimental Horticulture, was read as follows:

EXPERIMENTAL HORTICULTURE.

BY F. H. BRUNING.

Mr. President and fellow members:—The subject assigned me is Experimental Horticultural. I commenced over thirty years ago to experiment with different kinds of fruit as we did not know what to plant. I planted almost every thing that I could get hold of because I did not know what was suited for this climate. I had a good many failures, a good deal of my attention was paid to pear trees. The first I bought were dwarf trees, the most of them soon died except the Duchess De Angolemme One of them is still a live and bears every year. It stands on the north side of an Osage Orange hedge which shades the ground. I have tried different plans to raise a hardy pear tree. I have budded them on Red Haws, also on Service berry. On the Red Haw they grew well for a year or so; some bore fruit but soon died. On the Service berry they grew very slow, but appeared more hardy, but the fruit is rather small, but I think they will make a very good dwarf pear tree; they appear to be healthy. I next tried the Standard pear on high white oak ridge. The Flemish Beauty, Tyson and Clapp's Favorite did the best; they did well as long as I kept the ground well tended. I have now replanted with Russian Pears with the intention of crossing them and raising seedlings. The Russian pears grow very slow.

My experiences with peaches is that we can raise peaches by laying them down close to the ground. When the tree gets a fair start I cut it off the next year. I let about four sprouts grow up, let them grow two years and

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then I lay them down when winter comes and cover them up a little. Next spring I let them raise up. My China peach trees froze down to the ground last winter, they were not layed down but through up new sprouts.

My China apricots proved to be hardy but have not fruited yet. Prunu Simonii proved to be perfectly hardy with me, has now blossom buds on. So has my Russian apricots, I have a good deal of faith in them.

I have tried the Highland cranberry, and some I brought from Washington Territory, but they all proved to be a failure. I have tried four kinds of Huckleberries and they all proved to be failures. I also brought a lot of evergreen trees of various kinds from British America and Washington Territory, they grew fine the first summer, but soon all died. Next time I brought some from the Rocky Mountains they proved to be satisfactory. The Concolo appeared to be the easiest to grow from seed. But the Blue Spruce and Abies Grandes I think are rather the best trees. The Cancolo is the greenest tree that I have got in the winter. They are all very easy grown from seed. They are all very easy transplanted. The Abies Grandes readily grows from layers. I have seen hundreds of them in the mountains where I have been where the limbs had taken roet. The Abes Grandes and the Blue Spruce grow together where they are the most exposed next to the snowy range. For ornamental trees in the lawn I think that the Blue Spruce and Abies Grandes can't be beat. Concolo makes the best of timber; they make good fence posts and grow very rapidly.

The following paper by L. O. Williams was read on Insect Enemies.

OUR INSECT ENEMIES.

BY L. O. WILLIAMS.

The past season of unparalleled drouth has been especially favorable to the development of insect life. The rapacious cut worm was unusually abundant this spring. In a two-acre patch of tomatoes I found, after the first setting, an average of about two worms to a plant. It is not necessary to state that I lost nearly all of my first setting and quite a portion of the second. Even after a third setting, which I delayed as late as possible, I lost a small per cent of plants. A few growers for the canning factory were so discouraged by the ravages of this pest as to plow up or abandon the patch. Although the worms seemed to be partial to the tomato, their tastes required a variety of food—cabbages and corn were in demand; they even visited my strawberry plantation, and seemed to take special pleasure in nibbling on my pet Jessies and other valuable varieties. There seems to

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be no effective means of destroying this pest other than that of decapitation by hand. Poison is hard to administer to them, since they work mainly on the stems of plants. Freshly cut clover has been recommended as a cheaper food than vegetable plants, and they may be induced to feed on this as a substitute by scattering it about in the field freshly set with plants. I do not know the life history of this underground species, but it occurs to me that their numbers might be greatly diminished by fall plowing.

The cabbage worms were out in full force from the beginning almost to the close of the cabbage season. I tried Prof. Osborn's remedy of kerosene emulsion first, applying it with a sprinkler, although a garden syringe is necessary to do thorough work. This had the desired effect upon all worms that were fairly touched, but it had an unwholsome effect upon the cabbage, causing some leaves to blight, and on heads nearly formed the smell of kerosene went to market with them.

I next tried saltpetre, by dissolving a tablespoonful in a bucket of water and sprinkling the cabbages quite liberally with the solution. I also used common salt in the same way, only in larger doses. These applications produced no marked effect upon the worms, but seemed to act as a fertilizer to the cabbage. Several of the market gardeners near here use an insect powder called "slung shot," with quite satisfactory results.

In a neighboring field, tended by a woman and her two small boys, I saw Prof. Osborn's suggestion carried out, by destroying the butterflies. Instead of trapping them with a net, they used green willow brushes with which they floored the butterflies (I mean to try this remedy when my boys become large enough).

The white grub worm, larvae of the familiar June bug or May beetle, is becoming quite a serious pest, threatening the uprooting of our strawberry beds. In my new plantation this season I noticed their work, which is made manifest by the wilting of the main vine and often of the entire set of runners. I have taken pains to inflict capital punishment upon as many such depredators as I could find. I have heard several complaints of their work in old beds near Glenwood. Probably the best remedy for old beds badly infested is the plowing up of the entire bed, thereby exposing the worms to their natural enemies, the birds and chickens. Salt, scattered over the beds, has been recommended as a remedy, but with what practical results I do not know. A year ago last spring I noticed the parent beetle swarming at night in great numbers about the cottonwood trees near my house. One frosty morning, early in May, I found the ground beneath the trees thickly dotted with them, they being too stiff with the cold to work their way into the earth, though many of them were partially buried in the loose earth. I took cruel advantage of their condition by gathering up several hundred of them and burning them. As the beetles are fond of feeding on the leaves of the cherry, plum and poplars, it would seem that they might be destroyed by spraying trees visited by them with arsenic water. It is evident, at least, that as the larvae are several years in maturing, and live entirely under ground, any attempt at their destruction would best be directed toward the parent bug.

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The snowy tree cricket seems to be doing great injury in certain localities to the raspberry bushes. The only successful remedy seems to be the cutting out and burning of the affected portions of the bush—the eggs being laid in the pithy center of the new wood.

Another insect which is attracting attention on account of its recent multiplication and increasing depredations, is the stalk-borer (*Gortyna nitela*). It is found commonly in the stalks of the potato and tomato, but its injury to the fruit grower is confined mainly to the currant. The young wood, being infested by this borer, is caused to wither and die. The only remedy suggested is hand-picking.

I have not time to discuss the old-time curculio and coddling moth remedies, save to urge the more persistent and thorough application of them. One cause of the laxity with which the spraying remedies have been applied is, perhaps, the absence of a good spraying machine. This want seems to have lately been met by the Nixon Nozzle and Machine Co., of Dayton, Ohio, who manufacture a number of machines specially adapted for the work. Send for their illustrated price list. I know of but one other firm who offer anything in this line, and their address I have forgotten.

Finally, we need to exercise greater vigilance in our warfare against these apparently insignificant foes. We are apt to forget this great business as well as moral truth: "It is the *little* foxes that spoil the vines."

Silas Wilson: This subject is of great importance to all of us. They used to say that Michigan and New York fruit was free from damage of insects, but now their fruit is bothered with moth, same as ours. What are we going to do about it, is the question. It seems to me that we will be obliged to move, and move all along the line, if we get fruit free from insect damage. I would like to hear from Mr. Williams, I am told he has been using the Dixon remedy.

L. A. Williams: I did try it and thoroughly, and was pleased with the result; but as all apples in our vicinity are less troubled than common, therefore do not know just how how much good it did. However, I think the trees sprayed were troubled less than others. I dissolved the arsenic by boiling, and had two fifty gallon barrels on side, filled at bunghole. By driving between rows could spray on each side of wagon. It only took from two to five minues to spray on one side of two trees. I began when fruit was size of hazel nut or smaller. If mixture is too strong it will scorch the leaves some. It is not costly. I spent about a week, and as rains did not wash it off, did not repeat the operation. It is the most rapid mode I know of, and from my own and others' experience, I think it effective. If all would apply this remedy, think we could soon destroy most of the moth. Arsenic at wholesale costs only about twelve and one half cents per

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pound. One pound to two hundred gallons of water is about right. Mr. Follett thinks he has a remedy.

W. K. Follett: Mr. Williams says I *thiak* I have a remedy, I *know it.* If you will notice about the time trees come in bloom, about sun down, you will see the coddling moth flying in countless thousands; sometimes you will see them before the trees bloom. I take cider vinegar and sorghum molasses, equal parts, and put in tin cans, suspend these cans from the trees and the trap is ready. Old cans can be procured around town in great quantities, and a piece of light wire fastened in holes in sides, near top of can, are easily arranged, and you will be astonished at the number of moth you will catch. I put in every third row, and found that cans in south row were nearly full every morning for awhile, the ones farthest north caught but few, as compared with those at south side. The moth seem to fly with the warm winds of spring, and as such winds come from the south the insects of course come first to south side of orchard. The moth should be turned out occasionally and cans refilled, and am sure it is a good thing. My apples were almost free from worms this year. After early apples got ripe I got but few moth, but think the traps should be continued, as some come out late, or a second crop comes, and if not destroyed will lay eggs in apples of considerable size. On a twenty-two acre orchard I used only two gallons of sorghum molasses, and as I made my own vinegar the cost was but a trifle. Dont use commercial vinegar, even if it is labeled "cider vinegar," but get vinegar made from apples.

R. D. McGeehon: I do not like to throw cold water, but I have tried things that I thought were *sure* that I had to give up were not so. A few years ago Mr. Hardenbergh tried the molasses and vinegar remedy, and caught lots of moths and sent them to the Agricultural College, when it turned out that very few indeed were coddling moth.

Geo. Van Houten: When Mr. Dixon first published his arsenic remedy, some scientific men said it was not effective nor practical, but experience has proven it an effective remedy. If Mr. Follett's apples were free from worms, it will justify a thorough trial, as experience is worth more than theory. I am aware that some scientists say that coddling moth cannot be so trapped; but the experience of our careful and successful fruit growers will justify a trial of such remedies as seem to give success.

S. H. Redmon: I could get no plums for insects.

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W. K. Follett: This is not a remedy for curculio. Bunches of cotton batting saturated with coal oil placed in the trees, it is said, will drive curculio away.

L. A. Williams: Theoretically, coddling moths only deposit eggs while apples are small and early in the season.

W. K. Follett: The moth most assuredly deposits eggs after apples are of considerable size. Even in the fall in making cider I have seen the moths attracted by the smell.

Geo. Van Houten: In cool cellars the coddling moth do not develop until late in the season, and they will of course at once seek to deposit eggs. Some also claim that a second crop of moths sometimes develop and lay eggs. I am well convinced that the moth are not all gone with early spring. I hope members will give this molasses and vinegar remedy a trial and report at our next meeting; it is simple, cheap, and easily tried.

Thos. Bonham: I was requested by a neighbor to ask for a remedy for borers.

R. D. McGeehon: The snowy tree cricket, bores canes of raspberries, and then some folks think the canes are winter-killed. They also bore grape vines, and I have found them in weeds, also in the willow. The only remedy I know of it to cut and burn the infested canes, thus destroying the egg or larva. We may have to give up raising red berries on account of this pest. A strawberry worm, same color as leaves; if disturbed it will curl up and drop from the vines. The only remedy that is effective so far as my experience goes, is to fruit but one year and then plow the patch up and set in new ground. Slacked lime will drive them off but will not kill them.

Silas Wilson: I do not wish to discourage, and therefore hope that Mr. Follett will continue his moth trapping until he demonstrates whether it is successful, but I think that Mr. Dixon's remedy is good, and it is unfair for scientific men to try to get the credit of discovering it, as some of them are trying to do.

Mr. McNay: Tobacco leaves hung in fruit trees will keep many insects away.

Geo. Van Horten: A wash for trees to keep out borers has been asked for. If unslacked lime is put in a barrel, and water sufficient to slack be applied and sulphur put on the lime, the slacking will cause the sulphur to mix in the proposed wash. The barrel should be closely covered until the heat passes off. This is necessary to make the sulphur mix, as it is insoluable in water. After the lime and sul-

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phur are thus prepared, mix with soft soap and water, and if tobacco is put in all the better. If soft soap cannot be had, alkali and water will do. This wash if applied in the spring and renewed when washed off with rain, will keep borers out, but will not kill those in the tree. Those in the tree must be cut out; and as it takes from one to three years for the grubs to become perfect insects, some folks think washes a failure. If grubs are taken out and this wash applied very little trouble will come from borers.

It was decided to pay cash premiums as follows:

County collection fruit, $3; county collection fruit, second premium, $1.50. Best plate each variety of apples or potatoes, 20 cents; second best for each plate, 10 cents.

L. A Williams read a paper on Orcharding for Profit as follows:

ORCHARDING FOR PROFIT.

BY L. A. WILLIAMS.

I know of no branch of industry, in the pursuit of which large profits may be expected, unless the fame is rightly managed; and most certainly is this true of the business of growing fruit for market in this variable climate of ours. Many have experimented in buying a lot of trees and having them planted in orchard form, with reference to large profits in the near future, who have been doomed to sore disappointment because they have failed for lack of knowing how and what varieties to plant. Great care and good judgment should be exercised in the selection of healthy and well formed trees. Set them properly, not nearer than 25 or 30 feet apart each way, on *high, well-drained* land. For the commercial orchard plant but *few* varieties, and those of the best keeping sorts, or such as are most popular in our markets.

Many new varieties have recently been introduced, some of which after having been more thoroughly tested, may entirely supplant a part of the list we now consider profitable. Were I called on now to name a list of varieties for an orchard of 1,000 trees for *profit*, it would be as follows. Wine Sap, 200; Ben Davis, 200; Willow Twig, 100; Roman Stem, 125; Janett, 50; Jonathan, 150; Grimes Golden, 75; Duchess, 25; Wealthy, 50; Plums Cider, 25

These trees are fairly hardy, good bearers, and the fruit, when properly handled, is in good demand in our western markets.

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Silas Wilson: Why leave out the Iowa Blush?

L. A. Williams: It is small. I like it, but it is easy to get too many varieties in a commercial orchard. It is a good bearer and a good tree.

Geo. Van Houten: When we get over our prejudices we will grow profitable orchards. The greatest enemy of orcharding in our part of the State is sunscald. Even Ben Davis, Jonathan, Lowell and Maiden Blush thrive and are profitable where protected from sunscald. The best way to do this is to run rows toward half-past one o'clock sun; rows 28 feet apart; trees 10 or 12 feet in the row, to be thinned out as trees crowd too much; trees should be leaned in direction rows run. Alternate, if desired, with long life trees, so that the early bearers can be cut out first, leaving others sufficient distances to mature fruit. Trees will grow quite close one way if plenty of room is given the other way.

W. K. Follett: One day in town I met a man from Ottumwa, and while talking with him told him that Ben Davis winter-killed while Dominie and others did not. He gave me a remedy against winter-killing that I think is better than the Secretary's. His plan was to head treees at two or two and a half feet, and then nail two boards together like a trough, to be set on southwest of tree. Have boards of proper height to shade the body of the tree. Leave them until past danger of sunscalding. Where hogs are turned in in summer, these boards will have to be taken out or they will be rubbed down; but it is but little work to remove and replace them. When trees get to bearing they will shade their own trunks, or most varieties will.

Geo. Van Houten: Wealthy, and many other hardy kinds, cannot be made to shade their own trunks, as limbs grow too upright or start too high, and trees often lean so that they are exposed to sunscald; and if other trees are set in right direction, and near enough, no sunscald need be feared. If Ben Davis are used for nurse trees, they bear young and soon pay all expense of orchard. They can be bought by the 1,000 at $40.00, so they are cheaper than the board remedy.

Adjourned to 1:30.

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AFTERNOON SESSION—SECOND DAY.

Berry box committee reported as follows:

REPORT OF COMMITTEE ON BERRY BOXES.

WHEREAS, For several years berry growers in Iowa have been using the dry measure berry boxes, and have been trying to get growers in other States to adopt the dry measure as a standard, but without avail; and,

WHEREAS, The use of the dry measure as used by us must come in competition with the smaller boxes of other growers, thus entailing a very considerable loss on us as we get no better prices for the larger boxes; therefore,

Resolved, That as our efforts to obtain uniformity on the dry measure box has been a failure, we, the Western Iowa Horticultural Society, adopt the standard wine or liquid measure box, and recommend its general use.

R. D. MCGEEHON,
S. E. FIELD,
W. F. DAVIS,
Committee.

On motion the report was adopted.

Directors reports of Adams and Adair counties were read by the Secretary as follows:

REPORT OF UNION COUNTY.

BY HENRY JONES.

To the Western Horticultural Society:

As I was appointed Director for this county I will give you a few notes that I have picked up by the wayside. We have had a drouth and the fruit grower has had a hard road to travel. I will begin with strawberries. They set a full crop, but the weather was so dry they did not get very large.

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They were lacking in size, color, shape and flavor, but were good handlers. A nice shower toward the close of the season made them very soft, but better to eat. They were two weeks earlier than common and brought a fair price, commencing the 25th of May at 20 cents per box, and the lowest price was 6¼ cents. With me the crop paid as well as any I ever raised.

Currants, gooseberries and cherries were a failure.

Raspberries were splendid. Our rains were just in time for them. Black caps were earlier than usual; worth 15 cents per box. The kinds usually raised here are Doolittle's Improved, Miami and Tyler. The Tyler is a splendid berry here. The Miami is a very vigorous and good late berry. The Turner did well; not any earlier than usual

Blackberries set a full crop but the great heat dried them on the briers. Under good cultivation there was some good fruit, worth 15 to 20 cents per box. The Snyder is the kind raised here.

All kinds of berries have made a fine growth and the prospect is good for next year.

Grapes, crowning jewel of all. Words would fail to describe the crop of luscious grapes we had in this county; all kinds were good; they were almost burnt up by the hot wind the 8th and 9th of August, but a nice shower brought them out all right. The bulk of the crop was Concord; they were worth 2 to 3 cents per pound. In my vineyard I had Concord, Delaware, More's Early, Agawam, Clinton and Hartford Prolific. I saw many new kinds. They all seemed to do well this year. I was very favorably impressed with Elvira and Vergenes; many of the vines of all kinds were over-loaded and did not ripen up in wood for next year. Grapes were so plenty that every one could have plenty to eat and many of them were crushed and made into cider and prohibition has not kept it sweet. Plums were not a full crop but some very fine ones in the best locations. We have some very fine wild plums; the cultivated plum's were mostly Miners. They were loaded with fine fruit this year. I have the Spanish King and Green Gage; they do well with me and the fruit is nearly as good as peaches. The soil is bordering on clay or rich clay loam.

Apples were not as plenty as they are some years, but were a fair crop worth 50 cents per bushel. Many orchards are dead and dying; it seems to be more in the situation and surroundings of the orchard than in kind of trees, all of them that have a good grove on the north are played out and all of them that slope to the south are dead, the leading kinds that bore a good crop this year were Duchess, Red Astrachan, Red June, Sweet June, for early, and Roman Stem, Wine Saps, W. W. Pearmain, Ben Davis, Jannet and Willow Twig for late. The dry, hot weather ripened most kinds so they will not keep well; Roman Stems all get ripe and fall off before gathering time; Jannets were in good order to eat in November; the crop of Jannets was larger than any one kind this year. I saw a Rambo tree 30 or 40 years old with a fine crop of apples on it, and yet young trees of this kind do not do well. Many trees seem to be in good health and vigorous and the prospect for next year is good. The Grimes Golden did not bear many apples this year, but is in good condition for another year. Many kinds that are

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not largely planted had some fine fruit this year, and all kinds were high flavored and rich; Wine Saps and W. W. Pearmains were smooth and nice. The season was so dry that all kinds of insects, birds and beasts were very bad on fruit; I do not blame them much but would be glad if some one would tell me how to save my raspberries, blackberries and grapes and feed the birds something cheaper. I am nearly surrounded with brush and the birds swarm in June and they get the best berries before I get up. This is a good county for fruit, but some are slow to learn what to plant and where to plant it. We were visited by the tree agent this fall, and he had a wonderful budded tree that would never die and would bear every year, and the way the people bit was a wonder to local nurserymen. He sold thousands of trees at 50 cents per tree; if they do well we will send fine specimens to your meeting in a few years. People are not planting forest trees as they should; I think we should agitate this subject as long as the wind blows so hard over our homes; every one that is able should set a good example by planting evergreens and others will soon see the point and our beautiful State will soon be very much better.

FONTANELLE, IOWA, Dec. 16, 1887.

HON. GEO. VAN HOUTEN, *Lenox, Iowa:*

DEAR SIR—With what information I am able to command will report the successes and failures of fruit-growers in the county of Adair for the year A. D. 1887.

Summer and fall varieties were abundant, though some of the old varieties, notably the Maiden's Blush and Early June, are in many instances either badly damaged or dead, and here let me recommend for this section of country an apple which is too little known. It is the Dyer; and no better apple during its season is grown anywhere, and the tree is sufficiently hardy for this latitude.

Of winter apples, the Willow, which is just a shade better than a green walnut; the Roman Stem, under all circumstances and conditions of soil and planting; the Iowa Blush and Grimes Golden generally, and the Ben Davis, Wine Sap, Jenetting and Jonathan, under favorable circumstances as to soil and location, gave fair crops this year.

I should not omit to say a good word for the Fameuse, which is a good apple and a hardy tree, and fills in a gap between late fall and early winter apples, and should be generally planted. There have been many varieties of the hardier sorts planted within the last few years, which have not yet come to bearing, and we hope in the near future to be able to place Adair county in the front rank as a fruit-raising county.

Strawberries gave good crops, as a rule, though in some instances they were cut short by the extreme drouth.

Blackberries and raspberries, where shaded or heavily mulched, gave good crops, but in many places they were seriously injured by the dry weather.

Grapes were abundant and very sweet. There are many kinds of the better varieties of grapes now being planted and just coming into bearing, though grape culture in this county is yet in its infancy.

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Owing to a late frost last spring, the plum crop was a failure.

I herewith attach and refer to as parts of this report letters received from L. M. Kilburn and John Kurtzweil, both eminent in fruit culture.

A very few farmers are awakening to the need of planting windbreaks. Three years since I procured for L. M. Kilburn and Jas. H. Hulbert 1,000 each of Scotch pines, and they were so successful with them that last spring Mr. Kilburn ordered 1,000 White pines and 200 Red cedars, and Mr. Hulbert ordered 16,000 of different varieties, among which were 2,000 Red cedars, and D. W. Marquart, I think, about 1,000, 200 being Red cedars. I also planted 1,000 White pines and 300 Red cedars, all of which did well, notwithstanding the dry weather; and just here let me add my testimony in support of the Red cedar. The trees that I have already referred to were planted during the extremely dry, hot weather of last spring, and to all appearances commenced dying as soon as planted, and in the course of a week or ten days many of them appeared to be absolutely dead, and as brown as it were possible to be. Then Hulbert, Marquart and Kilburn anathamatized both myself and Brother Bruning, of whom I bought them.

I myself thought they were dead, but said nothing, and continued to hoe them about twice a week and kept the ground clean and loose, hoping against what seemed to be the inevitable, as the hot sun browned and curled them up ready for the brush pile; but upon the appearance of the first rain my hopes, as well as the trees, revived, and I did not loose a single Red cedar and very few White pine, and that was the experience of the other parties named; and the growth of the Red cedars was equal to three times the growth of the other varieties planted at same time, and I am sure that they are not appreciated as they should be. But the same may also be said of most other varieties of evergreens, and I only wish I had it in my power to compel every owner of forty acres of land to plant at least 500 evergreens of some kind or other.

Yours truly,

H. GRASS.

GREENFIELD, IOWA, Nov. 29, 1887.

MR. GRASS, *My Dear Sir*—Complying with your kind request, I must say that I experienced both success and failure.

My farm is on the main divide between Mississippi and Missouri rivers, in Madison county. My fruit patch is sheltered on the north by Russian mulberry hedge and orchard; on the west by maple and catalpa grove, and on the south by hedge row of Russian mulberries. By moving out last year to Greenfield, I did not have time to mulch my strawberry beds nor to lay down grapevines; I merely pruned them and left them to take care of themselves.

Two year old bed of Cresent, Mt. Vernon and Windsor Chief, having old mulch, brought quite good crop; the berries were smaller than usual. New bed of Crescent and Mt. Vernon, planted in the spring of 1886, formed well matted rows, but not being mulched, had no berries. My neighbor, having

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new bed of the same variety, also of Sharpless, raised no berries from the entire bed, because they were so rank he thought they would do without mulch. I have other varieties, but they winter-killed some and grew in weeds, having nobody to take care of them.

Of Black caps, Tyler and Souhegan alike brought forth a heavy crop of berries of better quality than the Gregg and ten days earlier. They are perfectly hardy on moist as well as on dry soil. The Gregg bore a medium crop of large berries; not quite hardy. The Ohio, Mammoth Cluster, Davidson's Thornless were grubbed out.

Of grapes, the Martha, Concord, Champion, Pocklington, Lindley and Worden bore a heavy crop without any protection last winter. The White Ann Arbor killed down some, yet bore some very fine grapes.

I remain, yours respectfully,

JOHN KURTZWEIL.

FONTANELLE, December 21, 1887.

H. GRASS, ESQ., *Dear Sir*—Your letter asking information in regard to the fruit crop of this section came duly to hand.

In reply let me express the opinion that while some kinds of fruits were a failure, notably cherries and the finer varieties of plums, yet a large amount of fruit was grown, enough to make low prices to consumers and not very satisfactory returns to producers.

The home market, that is the market in the producer's own family is the most satisfactory market after all, and every man may keep this demand fully supplied at no great expense.

The strawberry crop when not allowed to dry up was immense. I am fully convinced that a large amount of water must be supplied to strawberry plants in the fruiting season, to produce the best results. My bed is in a naturally moist location, and we watered considerably in the dryest weather; as a result we had magnificent berries with over four weeks between first and last pickings, with only two varieties, the Crescent and an unknown variety for a fertilizer.

Raspberries and blackberries are harder to supply with moisture in the absence of rain, and gave only a partial crop.

Miner plums produced a light crop, other varieties only a few specimens.

The grape crop was immense, but quality and size were somewhat affected by drouth and overbearing.

The apple crop was so good that prices were low and anybody could afford to eat fruit who is not too particular as to quality. Ben Davis, Jeniton and Wine Sap produced the best crops with me. The codling moth did considerable damage, though less than last year.

I have over thirty varieties that fruited last year, and yet have none with which I am satisfied, taking into account quality, productiveness and vigor of tree. We want a variety as good in quality as a Jonathan or Grimes Golden, as prolific as a Ben Davis, as late in coming into blossom, and as good a keeper as a Jeniton, and as hardy in tree as an oak or pine. When these conditions are fulfilled it will pay to plant an orchard for commercial

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purposes. The unwelcome fact is that our orchards are unthrifty, prematurally old, dying and dead. Some new departure must be taken if those that are to come after us are to reap the fruit of our plantings. Science and experience must discover some way to overcome the obstacles to apple culture which nature has placed in our way. Can it be done?

Yours truly,

L. M. KILBURN.

Silas Wilson: I would like to see the farmers present discuss these questions and these papers.

A gentleman asked if there was such a variety of raspberry as Iowa Beauty?

S. H. Redmon: I sold a variety for Iowa Beauty, but it proved to be Shaffer.

A paper, Marketing Fruit, by A. C. Sabin, and a paper on same subject, by S. Park, were read by the Secretary, as follows:

MARKETING FRUIT.

BY A. C. SABIN.

There are three essentials: First, to have the fruit; second, the package; and third, the disposal of it to the best advantage.

As regards the first, I find the great difficulty is to get it. There are two or three things necessary. The principal thing is, have large, highly colored fruit; and second, quality. The outside is of much more importance than the inside. If the outside appearance is satisfactory, it may be like apples of Sodom to the taste; for instance, you may put the Large Romanite beside the Roman Stem, the Wilson Strawberry beside the Jersey Queen, the Gregg Raspberry beside the Hopkins or Tyler, and see what is the result; the inferior fruit is taken every time, if it only has size and appearance. Therefore I say to you, with all of your getting, get size, and be sure to put all of the large ones on top, if you should be so unfortunate as to have any small ones. To be sure there will be disappointment when the purchaser comes to empty the package, but what of it? The fruit is *sold*, and so is the *buyer*.

But seriously, human nature is the same everywhere, and we, all of us, let our eyes deceive us; the question then is, does it pay? After another year's experience I am satisfied that honest packing is the only thing that will succeed. We do not face any of our fruit packages, except apples; and having

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shipped a few of them this year, I am convinced that it does nat pay to face them. It will pay much better to made two grades and let your name be so well established that your firsts will sell for enough more to make up the loss on the seconds. As an illustration, I would say that I sold a party 200 barrels of apples; showed him the fruit; told him we faced the barrels, and that the apples on the end of the barrel were better than those in the middle; shipped the fruit; got a telegram : "Apples refused"; had to go a hundred miles; found, as I expected, a few barrels of small Geniton faced with larger ones; discounted the small ones; lost three days time in the busiest of the season; lost on the apples; lost my expenses; and, worst of all, had hard work to convince him that there was no intention of fraud; am not going to do it any more. We assort berries when they begin to run small, but find it unprofitable; would much prefer to leave them on the vines or bushes, as we cannot get cost out of them.

Second, the package.

We find that a new clean package is much the most satisfactory. For berries we prefer the shallow Hallock quart box. Berries ship better in it, as there is less weight on the fruit, the package has more surface and presents better appearance. For grapes we prefer an eight pound basket with a wood cover to anything we have used. We use the one-third bushel box for cherries, plums and early apples, and regular apple barrels for fall and winter varieties. Be particular to see that your barrels are full and well pressed, and lastly sell them. This we find nearly as difficult as raising them. Your home market, if you have much fruit, is soon supplied. Fruit is ripening rapidly and the situation is becoming serious. We try and make arrangements with responsible parties in adjacent towns to take such a number of cases or baskets daily or semi-weekly during the season, and when that market is supplied and we still have a surplus we ship (I grieve to say it) to a commission house. I am glad to say that I have found some honest commission men, but a good many of them are still in the bonds of iniquity. A price list received this morning urges shipments. The market is bare of whatever you have to sell, and demand is very strong. You ship, when "presto change," large receipts in poor condition, market flat, don't ship any more over-ripe fruit! will do the best we can! Returns come slowly in. Express, drayage, loss, spoiled. Commission ten per cent and net proceeds *minus*. Your know how it is and so do I. Better to sell if possible at less than what you think fruit it worth than to consign it, but if you do consign it send it to an *honest* man. He won't tell you as much about the market being bare, but he won't *bare* on as hard in his returns. We have found it profitable in Glenwood, the most of us at least, to put our berries all into one dealers hands at home, and let him distribute them as he thought best, thereby saving an over shipment to any one point. In conclusion I would say grade high, use a showy package, and sell as soon as fruit is in condition. You will then get the average of the market, which is all you can expect.

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MARKETING OF FRUIT.

BY S. PARK, OTTUMWA.

Successful marketing of fruits may be styled a profession, and to be proficient in this business certain tactics must be observed. But no deceit, no misrepresentation, or falsehoods should ever be permitted to enter this (or any other) business; neither bandying of words or long disputations. On the other hand, be truthful, affable, and yet firm in your business and punctual as to time of delivering your fruits, and never promise more than you can reasonably perform. Don't contend for the last cent in change. You may build up or tear down a good reputation in a very short time. Most any boy or old lady can market fruits and obtain the highest prices by peddling them at private houses about the towns and cities. But the grower of fruits who has many tons to dispose of has something more to do than to enter a few boarding houses or private dwellings, *especially* when competition is sharp between home growers, to say nothing of the commission merchant who has daily consignments and is early on the alert to place his fruits on the market. It behooves the fruit-grower to be wide awake to secure his share of the public patronage. But his dependence is mainly on the middle men, the grocer and restaurant, and if he cannot secure their confidence and patronage he is left out and his only alternative is to ship his fruits or mount his fruit wagon and traverse the city and nearest villages for its disposal. At this stage, however, he may advertise to deliver fresh fruits daily and promptly on time in any part of the city at retail prices on orders left at his office. This move will bring the middle men up standing on your platform, for they cannot afford to let you do the retailing and they will soon learn to appreciate the force of such an argument. But harmony in all things is best. I would therefore advise that previous arrangements be made with these parties to sell your fruits at the market prices, paying them a commission or selling directly for cash, at the same time stipulating that if prices decline to or below a certain named price, you will withdraw from the market.

I do not believe in combinations in any business, yet I believe if a few of the leading growers would resolve they would not sell below a remunerating price, it would have much to do in making a staple market. I read that in some places raspberries were sold last year as low as five to six cents per quart. Such prices would soon crush out the business, and I believe the

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time is near at hand when we must resort to drying our surplus fruits. It will pay to dry the raspberry at seven and a-half to eight cents per quart for green fruit.

The wise or prudent man will guard against the worst contingencies of the market by procuring a good supply of boxes, crates and baskets, suited to his kinds of fruits for market and ship to responsible dealers on commission, or for cash on orders. There should be an exchange of sentiments and personal knowledge between fruit growers, comparing notes on the coming fruit crops. An interchange of knowledge would greatly facilitate unison of action and prices with all parties interested. This subject of marketing fruits is a large one, and I am only hinting at some parts of it that has not been printed and reprinted for years past. To speak of the mode of picking, packing, hauling to market, the kind and sized packages to use the condition of the fruit when put on the market; the honest weight on measure to be sold and much more has been laid before our people, and a small moity seek to profit by these instructions. Some how they do not reach the masses. Our horticultural literature seems to revolve in a small circle. The secular papers seldom *descend* or *ascend* to such a lofty height as to spread before their readers horticultural knowledge. There are a few honorable exeptions but this is the *rule*.

Jacob Smith: I handled three carloads of apples; one for myself and two for neighbors. I pick on ladders and hand down the fruit carefully with a rope. I have trees 18 to 20 feet high. We want to ship apples and have them get to market without being bruised. In buying, I went to several places to see apples. They had been shaken from the trees and put in piles, and of course I could not handle them.

L. A. Williams: As to facing barrels in handling apples, I think it right to put a good foot forward; people expect it, and if the inside of barrel are good, no fault will be found with facing with a little better class of apples. The way I do it to face, but without extra pains to get the best, and fill above head, so it will take some pressure to get the head in.

J. W. Murphy: I have had considerable experiences in handling fruit in last two years. It is hard to find an honest commission man, but I find that uniformity, and quality of fruit, have more to do than commission men. Perishable apples should not be barreled until ready to ship. It pays to throw out inferior stock. The first sight sells fruit. The buyer or seller have not time to turn out or assort fruit, and the grower should put it up in attractive form. I think the commission men have been scored too hard. The first thing some

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fruit growers do, is to sell off their best fruit at home, and then crowd off the balance on commission men.

Thos. Bonham: I think fruit growers can establish a market, by having an arrangement with consumers. I sold apples at 80 cents per bushel and 20 cents a peck, while apples were selling at 40 cents a bushel; but they must be hand picked and handled properly. I had no trouble to sell grapes at three cents a pound, but I had no commission men to deal with.

Committee on fruit display reported as follows:

REPORT OF COMMITTEE ON FRUIT DISPLAY.

We, your committee on fruit display, find the two counties of Mills and Taylor represented in the display as follows:

Mills county thirty-eight plates of apples, consisting of thirty-four varieties—all but three named.

Taylor county eighteen varieties, including two seedlings and two unnamed varieties; and we recommend that the first premium of ($3.00) be awarded to Mills county, and that the second premium of ($1.50) be awarded to the Taylor county collection.

In the individual display we find the following entered for premium:

By Jacob Smith of Adams county, Willow, Milam, Jonathan, Ben Davis, Dominie, Winesap, Seek No Further, Talman Sweet, Yellow Bellflower and Northern Spy. As there is no competition for this premium, we recommend that a first premium of 20 cents each be awarded to the following varieties: Ben Davis, Willow, Jonathan, Dominie, Winesap; and a second premium of 10 cents to each of the following: Seek No Further, Milam and Northern Spy.

We also find two individual displays of potatoes as follows:

A. C. Sabin of Glenwood, nine varieties; J. W. Murphy of Glenwood, five varieties.

We recommend premiums as follows: J. W. Murphy first premium, 20 cents each, for Early Ohio, Mammoth, O. K. Prolific, Red Peachblow and Beauty of Hebron.

A. C. Sabin, first premium on each of the following: Telegraph, Crane's Potentate, Lee's Favorite, Clark's No. I, and a second premium for Thorbern, Pearl of Savoy, Early Ohio and Beauty of Hebron.

L. O. WILLIAMS,
R. COLBERT,
O. G. HOWARD,
Committee.

A paper on plums by H. Grass was read by the Secretary as follows:

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PLUMS.

BY H. GRASS.

If any apology were needed on my part for attempting to write an essay on plums it would probably be sufficient excuse for me to say that I know very little about the subject in hand.

If I were as well prepared for the discussion as the fellow who, by way of preface, said: his name was Plum, that he lived on Plum creek, and was plum full of plum pudding, I would perhaps have less difficulty. But I can give to you my experience in plum raising which may contain for some others as it did for me a lesson of value. Perhaps it was fifteen years since that I purchased from one of those smooth, oiley tongued friends of humanity five varieties of the choicest plums then grown in North America.

I was to have two of each kind, and I was just as contented over my imaginary choice fruit for a few years as if I had really possessed the best in the land. But when they came to bearing there came a change of feeling on my part toward the assumed guardian of my welfare as you may imagine when I tell you what kind of fruit they produced.

I had two early Chickasaws and eight coarse wild plums, all alike, but thinking that the wild plums might get better as they grew older I allowed them to bear for a few years, and while I did so two Miners that stood near them produced large crops, but not liking the fruit of the wild plums I had them top-worked with what we called Spanish King, a large purple plum, and the Blue Imperial, a very large egg shaped plum, and this was the beginning of my education in plum raising.

The first thing that I noticed before the grafted fruit came to bearing was that the Miners ceased to yield their annual crops of fruit, and I have not had to exceed one half bushel in any one year off of three large Miner trees, so that the first lesson that I learned was that my Miners needed fertilizing to make them fruit.

My Chickasaws bore heavily every year except perhaps two years, one of which was A. D., 1887. The fruit is very much better than the Miner and ripens in the month of July and with me they have proven to be curculio proof. Considering all things I consider them a very desirable fruit The tree is perfectly hardy and they should be generally planted.

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My grafted fruit, both the Spanish K..g and the Imperial have borne several crops of magnificent fruit as fine in appearance and as desirable for eating and canning as any California plums I have ever met with.

The old trees from which the scions were taken, have long since been dead while the grafts are still vigorous, and the second lesson that I learned was that half hardy plums made sufficiently hardy for this latitude by top working on hardy stock. I have now growing about all of the newer varieties which have been recommended for planting for fruit or experiment, but they have not come to bearing, so that I cannot speak of their merits. The agent and I are now the best of friends and I regard him as an angel in disguise. If I had received from him what I ordered I would have had no plums and the stocks would not have been hardy enough to bear top working and so I would have made no experiment and gained no knowledge on this subject.

Geo. Van Houten: A good deal of the failure in plum growing may be attributed to the fact that varieties are planted alone. If several varieties are planted intermingled, they are nearly sure to bear. The Wild Goose is the earliest variety that I know about, and Forest Garden come in a little later. The Miner is among the latest. So, with these three varieties, if planted in groups, with varieties intermingled, it is easy to get good crops of plums. The Miner, especially, fails to give satisfaction if planted alone.

Thomas Bonham: I am glad Mr. Sabin in his paper recommends thorough cultivation. Year before last I picked of raspberries, from ninety rods of ground, 1,600 quarts. A good way to dispose of old canes is to take them out and cut them up with a spade.

L. A. Williams: I take a rake 34 inches wide and pull through with a horse.

R. D. McGeehon: I see Mr. Sabin speaks of Stone's Hardy, Ancient Briton, Taylor, and other varieties of blackberries. I have got down to Snyder alone. Stone's Hardy winter kills and rusts. Western Triumph does not bear; in Minnesota they raise it and Ancient Briton, but they lay them down and cover them up. I never saw any advantage in taking out old canes from the berry patch in summer or fall. If you take them out during the growing season you are liable to injure the new canes.

Committee on Budded Trees reported that trees budded on French crab seedlings were not reliable.

Motion to amend, by adding after words French crab seedlings, "or other seedlings."

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The amendment prevailed, and motion as amended carried unanimously.

On motion of Silas Wilson the arrangement of premium list for next year was referred to the Executive Committee.

On motion the adoption of a fruit list was made the special order for this evening, following election of officers.

On motion of L. A. Williams, the constitution was changed so annual meeting would be on second Tuesday of December instead of third Tuesday, as at present.

Adjourned to meet at 7 P. M.

EVENING SESSION—SECOND DAY.

Secretary made financial statement as Secretary and Treasurer, as follows:

Paid for paper	$ 1.00
Stamps	11.50
Note-heads	8.50
Stationery	1.00
Cards (Postal)	5.00
Printing programmes	5.50
Printing cards and notices	1.75
Postal cards	1.75
Salary last year	50.00
Due Secretary last year	11.96
Total	$ 92.96
Received from local committee and miscellaneous	11.65
From State Horticultural Society	50 00
Membership fees last year	56 00
Total	$117.65
Deduct amount paid out	92 96
Amount in hands of Secretary	$ 24.69

This does not include money received during this meeting, or salary of Secretary for the past year.

GEO. VAN HOUTEN,
Secretary and Treasurer.

On motion the report was received and adopted.

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On motion the salary of the Secretary, for the past year, was fixed at seventy-five dollars.

Election of officers declared in order, and resulted as follows:

President—S. W. Wilson, Atlantic.

Vice-President—W. K. Follett, Malvern.

Secretary and Treasurer—Geo. Van Houten, Lenox.

Assistant Secretary—L. O. Williams, Council Bluffs.

DIRECTORS.

Taylor county—R. G. Moon.....Bedford.
Union county—Henry Jones.....Afton.
Montgomery county—T. E. Ellett.....Red Oak.
Mills county—A. C. Sabin.....Glenwood.
Pottawattamie county—A. B. Mair.....Council Bluffs.
Cass county—R. D. McGeehon.....Atlantic.
Harrison county—M. Pugsley.....Woodbine.
Guthrie county—Richard Hopkins.....Bear Grove.
Shelby county—J. B. Black.....Harlan.
Sac county—L. J. Van Sands.....Odebolt.
Page county—S. E. Field.....Shenandoah.
Adams county—Jacob Smith.....Brooks.
Fremont county—S. S. Orr.....Plum Hollow.
Dallas county—John Wragg.....Waukee.
Madison county—W. H. Lewis.....Winterset.
Adair county—L. M. Kilburn.....Fontanelle.
Ringgold county—D. N. Smith.....Lenox.

Council Bluffs was fixed as place of next meeting.

FRUIT LIST—APPLES.

Summer—Duchess. For home use, Whitney, Red June, Early Joe. For trial, Grand Sultan, Thaler, Yellow Transparent.

Fall—Lowell, Coles Quince, Wealthy, Fameuse, Fall Orange. For trial, Longfield.

Winter—Jonathan, Grimes, Winesap, Janet, Roman Stem, Ben Davis. For trial, Antonovka.

On motion, completion of fruit list made special order for to-morrow morning.

Adjourned.

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THURSDAY MORNING SESSION.

Society proceeded to completion of fruit list.

Crab apples—Alaska, Hyslop, Soulard.
Cherries—Early Richmond, Late Richmond, English Morello. For trial, Wragg.
Plums—Wild Goose, Forest, Garden, Miner, De Soto, Wolf.
Currants—Cherry, White Grape, Fay, Victoria, Red Dutch.
Grapes—Moore's Early, Worden, Concord, Lady. For trial, Niagara.
Raspberries—Turner, Cuthbert, Gregg, Shaffer, Ohio, Tyler.
Strawberries—Crescent, Wilson, Charles Downing. To fertilize, Crescent, Capt. Jack.
Blackberry—Snyder. For trial, Lucretia Dewberry.

Directors' reports for Pottawattamie, Fremont, Guthrie and Montgomery counties were read as follows:

REPORT FOR POTTAWATTAMIE COUNTY.

J. R. RICE.

The past season has not been as favorable for small fruit as usual.

Strawberries were almost a failure, principally on account of the drouth, and next year's crop must necessarily be very small, as there are very few good fields left.

Raspberries were more than half a crop, but blackberries were almost a failure.

Early Richmond and English Morrello cherries bore a light crop; other old sorts were not worth picking. The Ostheim fruited some on young trees, and promises well.

The Forest Garden, Baldwin, Hawkeye and Pottawattamie Plums bore good crops, but the European varieties were as scarce as usual.

Goose berries and currants were an average crop, and I would like to ask

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if any of the members have fruited the Smith's improved gooseberry, and if so, with what success.

Apples are the fruit for us if we can raise a crop of marketable quality, but what have we to depend on for fruit. There was quite a crop of summer and fall fruit, but the worms injured late apples enough to make the crop unsatisfactory in amount and quality. Ben Davis and Janet's are the principal apples in our cellars, and who will give us varieties to take their place. A tree as prolific and capable of enduring fifty Arctic winters and not give out after bearing one to five crops of fruit.

We can raise enough Russian mulberries to feed the birds if they will be satisfied with the fruit, and hope for more favorable winters in the near future.

REPORT OF DIRECTOR OF FREMONT COUNTY.

BY S S ORR.

So far as it regards the small fruits of Fremont county I will state that we did not have but little over one-half crop last season on account of dry weather, which not only cut short raspberries, black berries, etc., but affected the grape crop also. The cherry crop was very light, so was the plum. We had some peaches in the south part of the county, but the number of trees was limited to only a few. No great strides made in putting out young trees of any kind. Old orchards still on the decay, especially inside the bounds of the hail belt of 1883.

Young orchards of fair cultivation and good attention made a good growth during the summer, and the fruit on such orchards was of fair size and good quality, while neglected orchards or young orchards well sodded in grass made but little growth, and fruit was generally small.

The summer apple crop was very good, and a fair crop of early autumn. The winter varieties in some localities bore good crops, but not so good as in 1886. The general crop was lighter than the year before, the average price at the orchards being about forty cents per bushel.

The pear crop was the best I have ever seen, and sold for a fair price; the quality only moderately good. There was considerable blight to be seen in some localities about the first of June, especially among those varieties that make a strong early growth, like Transcendent crabs. If there has been any seedlings of note discovered, I have not heard of them; but do not think there are any.

The prospect for a good yield of all kinds of fruits is excellent at the pres-

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ent time. All varieties of trees shed their summer coats before cold weather, and the twigs all seem to have ripened before winter set in.

Respectfully submitted, this 20th day of December, 1887.

REPORT OF GUTHRIE COUNTY.

BY RICHARD HOPKINS, BEAR GROVE.

The people of this county are gradually becoming more interested in fruit culture. The exhibition of apples at our last fair was very fine, considering the dry weather. John E. Lyle, of Cass township, usually carried off the first premium, but failed this year. Mr. Taylor, of Guthrie Center, takes the lead in small fruit culture.

A new nursery of about ten acres has been established in Union township by Mr. Taggart, where all kinds of trees kept in such nurseries can be had.

Nichols & Lorton, of Davenport, canvassed this county with the new idea that budded trees was the true remedy for all the loss that occurred in the old orchards, claiming that in root grafting the trees were rotten in inception. Their agents took quite a number of orders for trees which were very small, merely as an experiment.

The Duchess of Oldenburg was the most prolific bearer this season, the Willow being next; the Winesap was a moderate crop of very superior quality. Whitney No. 20 was a good crop, and trees look vigorous and healthy, and all trees not stricken by the terrible freeze are going into winter in very good shape.

The old orchards are still dying out, as if they had received a death sting years ago and it would be only a question of time when all would go.

Cherries were a light crop this season. The Early Richmond are all killed in low lands. The Wragg cherry presents a very healthy appearance, but have but little fruit this season.

Plums were almost a failure from late frosts.

Grapes were an abundant crop of good quality; the Concord was the variety most raised.

Strawberries were hardly a half crop, owing to dry weather, and quality medium. They are being more extensively planted this fall, and it is hoped that this county will supply her own markets in the future. The varieties most in cultivation are the Crescent, Downer and Wilson, with some Jerseys.

Currants was a very light crop, except in some favored locations.

Some parties report immense success with the Lucretia dewberry, and

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quite a number will be planted in the spring; others say it only happens occasionally that the production is so great.

But, notwithstanding the cultivation of small fruits is on the increase, grocerymen say that the heaviest bills of many families are for canned and dried fruit. It seems that by a few hours labor at the proper time such bills of expense might be avoided and every family supplied with what they know to be good wholesome fruit.

The past dry season was hard on transplanted evergreens, but some farmers are determined to succeed and set the chronic croakers back in their fogy opinions; and this being a day of organized trusts, why cannot the farmers cultivate a few acres of timber to supply the home fuel and be independent of coal and transportation combinations.

DIRECTOR'S REPORT, MONTGOMERY COUNTY.

BY O. G. HOWARD.

Not being myself practically engaged in any horticultural pursuit probably I am not sufficiently posted to give an exact report of the general condition of fruit interests in our county. A fact I *can* positively assert is that a fair yield of very good quality of fruit of most kinds was obtained the past season. Summer and fall apples were unusually fine specimens and most varieties of winter matured an average crop, though the yield of late fall and winter was greatly reduced by reason of dropping before ripe, supposed to be caused by extremely dry and hot weather during summer and fall, and so far as my own investigation has extended I do not think this falling from trees was caused by any constitutional weakness or permanently damaged condition of the tree. Grimes' Golden, Jonathan, Rome Beauty, some of the Pippins and Russets together with old trees of Yellow Bellflowers and Northern Spy, and probably others of what are classed as *half hardy* apples of good quality seem to be in general good condition and bringing their fortunate owners fair returns with good general promise for the future.

Many others of more common varieties are not doing nearly so well, and I am safe in saying that it is only in more favored locations that Ben Davis, Genitan, Willow Twig and many others largely planted on account of greater hardiness are to-day in equally as good condition as the former list.

Plums were a short crop generally speaking, yet the same space of ground could scarcely be more profitably employed than plum orchards netted their owners this year.

Berries of all kinds though promising so abundantly early in season, were

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cut down to almost nothing after first few pickings—supposed to be caused by extreme drouth and heat, but my own opinion is that there were few berry canes that did not show traces of injury from effects of last winter.

Concord grapes cannot be claimed to be in full bearing vigor as all older vinegards bear evidences of rigor of winters of 1884-5 and of 1885-6. Would time and patience of society permit I would be glad to give some of my individual experiences as an *amateur* "horticultural crank," but forbear.

L. A. Williams: Can any one answer Mr. Rice's question about Smith's gooseberry?

Thos. Bonham: We got them several years ago, and they did well until we layered them heavily, since which they have not done so well.

A gentleman asked about the wealthy. Said it was failing at fair time this year.

T. E. Ellett: It was in its prime by the first of September this year.

L. A. Williams: I have had Wealthy bearing for sevaral years. They have to be taken to market as soon as ripe, and must be handled carefully.

Mr. Ford: The Dyer is a good apple, but must be handled with great care. Is Wealthy firm, or will they have to be marketed by express?

L. A. Williams: We cannot afford to send apples by express.

Mr. White: You have struck a subject now that I am interested in. Since our inter-State railroad law went into effect, the railroads cannot rob us, but they turn us over to the express companies and they can rob us at pleasure. They charge $4 per 100 pounds on grapes to Denver. We should have a law in this State, compelling the railroads to carry fruits in special cars.

On motion, the President was authorized to appoint a special committee to draft resolutions on transportation of fruit.

Committee appointed as follows:

L. A. Williams, G. W. Franklin, A. F. Collman.

On motion it was decided to close the session at 12 o'clock, noon.

Committee on Final Resolutions reported as follows:

Resolved, That our thanks are due, and hereby tendered to the people of Red Oak for their very hospitable entertainment, and to the Hotel Johnson for their liberal reduction in rates to the members of the Society; also, to

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the Chicago, Burlington & Quincy Railroad for returning members at one third fare.

Respectfully submitted,
SILAS WILSON,
GEO. W. FRANKLIN,
L. A. WILLIAMS,
Committee.

On motion the resolutions were adopted.

A paper on Evergreens, by John Wragg, was read by the Secretary as follows:

SEEDLING EVERGREENS.

BY J. WRAGG.

As the past two years have been so prolific in discouragement to the evergreen planters of Iowa and the west, perhaps some observations as to what has done the best in the past, and is therefor most likely to be of value in the future, will be of use to the many who wish to surround their homes with groves and specimen trees of our truly, beautiful conifers. We have planted in the past two years one hundred and fifty thousand small evergreens of the different well known sorts, we have watched and tended them carefully, and after seeing two-thirds of them die; despite our care, think we are fully justified in advising others, as to what to plant in the future to obtain the best results. The three best we think are Scotch pine, White spruce and Red cedar. We all know what a "boom" has been made the past few years on White pine and Arborvitæ, and we have been told through the papers that they were the best for all uses, and that seedlings from the forest, could be planted on our prairies with but slight loss. Many thousand of *deed trees* are the best indication of the above error. The *main spring of this "boom"* lies in the fact that these two varieties are growing by the million all over northern Wisconsin and the Lake country; they grow so thickly that a man or boy can pull and pack many thousand in a day, and that they can be cheaply shipped to all parts of the west. We certainly do not wish to be understood as discouraging the planting of White pine. One of our noblest trees' by no means; but we *do* wish to warn the farmer who wishes a few hundred plants for a shelter belt, *not* to buy *forest seedlings* of parties who furnish such seedlings by the hundred thousand, unless he is *convinced* that the *dealer* will use as much care in *taking up* and *packing his* little lot of trees as he would if he were intending to plant them himself.

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The reason is obvious. Certain parties, engaged in the business of selling forest tree seedlings to make money, they advertize to furnish them very cheaply, they go to the northern forests in the spring, where in more or less shaded and moist locations, the little plants are growing by the million, and as thick and spindling nearly as grass, and in some cases, where they have grown in beds of moss, and where the roots have never yet touched the soil, they hire *cheap* men and boys to *pull* and *pack* them for their customers. First they are *pulled* not *dug* and piled up for the convenience of the packers and are more or less exposed to sun and wind, till packed, which perhaps is not for twenty-four to forty-eight hours. Let us follow, if you please, the fortunes of, say a thousand of these little delicate children of the forest. The pullers find a patch of little White pine growing in a partial shade, and quite thickly; so thickly than they pull four or five at each handful; if no thicker than this they will be more than average good plants. As they are pulled they are placed in piles with the roots all one way, for convenience in counting and packing. The *roots* of at least *one-half* have been pulled *off* in pulling them up, but they are put in for they are to *cheap* to allow sorting and throwing out the poor ones. All day long, these much abused little plants are allowed to stand in the sun and wind, and next morning the packers begin and the first thing a call is made for one thousand White pine, 8 to 12 in high for Mr. A. of Red Oak, Iowa. The plants are taken from the *top* of the first pile, the roots by this time are dry, and most of the plants dead, but they are still green, they are well and carefully packed in moss and piled up with many others. When a wagon load is packed they are taken to the rail road station, perhaps a half days journey; in about two weeks they will reach the expectant Mr. A. having been delayed by the usual causes that *always attend perishable* goods, and that are marked "no delay." Our thousand trees will start from their native grove about the 20th of April, not sooner; in their two weeks journey to Red Cak they will travese about three degrees south, arriving there early in May. Mr. A. will at this time hurrying with his corn planting, but will plant his *now* nearly worthless trees in such way as he has becn directed, and without shade. August will generally find nine-tenths of the plants dead, and such a dry year as the past, all of them. This is no fancy sketch, but it does not follow that all the seedling forest tree dealers are dishonest, by no means; but competition makes them offer plants too cheap for good work; they hire cheap labor that neither knows nor cares for the ultimate success of the plants. A few years since I obtained a few thousand White pine seedlings from Chippewa River, Wisconsin, taken up and packed by a personal friend and with *great* care, seventy-five per cent grew and made nice trees, since then I have procured 25,000 from other parties who make it their business and with the greatest care and all the skill we are masters of, have only saved about one in fifteen. If the money that has been paid out of Iowa the two past years for seedlings had been paid to the nearest reliable nursery for once transplanted trees, the result would have been a much larger crop of trees, profit and and satisfaction to those who have paid it. The Red cedar is the only evergreen that is safe for the non expert to plant as a seedling. In conclusion I

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reiterate what our most experienced planters have proved and said, that for the greatest and most *immediate good*, the Scotch pine stands at the head as the tree for protection; this with Spruce and White pine are the three best we have for shelter purposes.

Motion made and carried, that we adopt a list of evergreens.

EVERGREEN LIST—(Western) Red Cedar, Scotch Pine, White Pine, Norway Spruce. For hedges and screens, American Arborvitæ.

Committee on Transportation of Fruit reported as follows:

That we ask the State Horticultural Society to present our requests, by resolution or otherwise, to the State legislature, at its next session, to enact a law that will insure to the fruit grower a rapid and safe transportation of fruits to the markets at a reasonable rate.

L. A. WILLIAMS,
GEO. W. FRANKLIN,
A. F. COLLMAN,
Committee.

Report adopted.

A. C. Sabin, J. W. Murphy, Geo. Van Houten, Jacob Smith and others donated part of vegetables and fruits on exhibition, to the Society; which were sold at auction, W. K. Follett, auctioneer, bringing five dollars and fifty cents, which was turned over to the Secretary.

On motion the Society adjourned to meet at Council Bluffs in regular session December 11, 1888.

GEO. VAN HOUTEN, *Secretary.*

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ADDITIONAL PAPERS.

The following papers were either not read for want of time, or read and not discussed :

TREE PLANTING.

BY JACOB SMITH.

A few thoughts on tree planting of different kinds, and fruit in general. First the apple tree comes in my mind. You must first make up your mind where you want your orchard, and then prepare your ground in the fall; that is, plow your soil deep, and then your ground is ready for use; then mark your ground off each way, as far apart as you wish your trees to be, and great care should be taken to insure your trees to grow; be sure and dig your holes large enough to admit all the roots straight, without cramping them, the same as they grew in the nursery, leaning the tree to the one o'clock sun; if your ground is too dry, fill up above the roots with the top soil, press down with hands, and then put about one-half gallon of water to each tree; go on till you set ten or a dozen trees, and then go back and fill up and press down with foot, and then it is well to mulch with some kind of old, half-rotten straw, about one yard square and about two inches thick. This is the way I plant trees, and I never fail. Watch and be vigilant, and keep out all borers. The orchardists have a great many more things to contend with than in former years. The chief cause of death in a great many trees and shrubs when dug in good condition, is exposure to the sun, drying up the roots. The pedlar's trees nearly all die from this cause. Always get your trees at your nearest nursery; buy your trees at home. If you want apples set a Ben Davis.

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I think the best time to remove a tree from the nursery is at three years old, of course the nurseryman would like them to go sooner as they are less trouble to handle, fall digging will do if the right kind of care is taken. I prefer to go to the nursery in the spring and get my trees fresh; get a Ben Davis from A. F. C., as he thinks the Ben Davis a standard apple.

My orchard is in a fair condition, yet there are a few that are dead. I shall fill up in spring with Ben Davis and Jonathan. Ben Davis is my first for profit until we get something better.

The craze is Russian and budded fruit. Some are getting them to their hearts content. I think, my brothers, we had better stick to our native fruit if we want to have fruit in the future. I saw some of your Russian fruit at the State Fair. I looked it all over. Oh; Russia it was a little too warm for you, as the most of it was badly decayed; how did our native fruit look? Let the people answer.

When I first came to this country in 1857 there was plenty of wild fruit of all kinds, up to seventy they began to fail. Why is this?

The time for shaping your trees is the second year after setting, leaving the tree the heaviest to the south-west, keeping right on until your tree comes into bearing, then stop pruning large limbs and keep out all sucker sprouts. In cutting too large limbs from a tree injures the life of the tree; a small cut is easier healed than a big one. I find the best time to prune trees is about the first of June, they heal better and doesn't injure the tree if we judge from the past for the future for the last ten years. We will have to keep close watch to our orchard, we have a great deal more to contend with than we had a few years ago. The southwestern part of Iowa is certainly the best adapted to fruit at least the last few years prove it to be so. The best way to keep up your orchard is to keep on setting trees. Small fruits of all kind do well with me, my Snyder blackberry was a full crop this year, lasting about three weeks. We picked about six hundred quarts of berries off of a small patch this season. Owing to location the drouth did not hurt them much while my neighbors complained of their berries being all dried up and gone, mine were fresh and nice.

My raspberries are all gone except the Golder, they are the nicest berry I have found yet. I would like to have some Russian varieties.

Grapes were a full crop this season; my vines were loaded until there was no more room for grapes. I have been asked how came your berries so nice, and this is my answer, I just kept them clean from weeds and pruned them.

My apple crop was pretty good this season, my best bearing trees were the Ben Davis and Jennett. I have a great many more, some good and some that are not good. These last are mixed with the Russia variety I think.

I will finish my few remarks by giving a few names of fruit trees that will do well to raise in this county: Ben Davis, Jonathan, Romanstem, Wine Sap, Willlowtwig, Jennett, Fameuse, Dominie, Fall Pennick, Dyer, Lowell, Duchess, Early Pennick and some others. Nurserymen, propagate of these kinds for this part of the country and do not mix with so much Russia.

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PLUMS, OLD AND NEW.

BY H. A. TERRY.

Having made the growing of plums a specialty for the last ten years, I will give a list of those that I have found of value.

Moreman—This is a cross or hybrid of the *chickasaw* and *americana* families, having the foliage and general appearance of the common chickasaw plum. It is a strong grower and healthy and hardy. The fruit is of medium size, of a brilliant red color with a glossy appearance that would lead one to suppose that it had been varnished. The fruit is of fine quality, but is rather a shy bearer.

Newman—This is another hybrid, and although the fruit is not large it is so very productive that it is well worth growing. The fruit is medium sized, of a bright scarlet color and of good quality. This is probably a seedling of Wild Goose.

Winnebago—This variety is in the *americana* family and comes to us from Minnesota. It is wonderfully productive, with fruit above medium, of a peculiar orange scarlet color, and white flesh. It is fine for culinary use.

Wady's Early—The chief value of this plum consists of its great productiveness and its early ripening. It is a fair sized fruit and of good quality for canning, but the tree is such a straggling grower that it is almost impossible to keep it in shape. Perhaps we had better plant more of the better ones.

De Soto—This is a very fine sort with large fruit of excellent quality, which is produced in great abundance. This variety seems to grow and bear well in nearly all localities, so far as the returns have come in. It originated in Wisconsin, and of course is hardy in any part of Iowa. It is well worth planting.

Wolf—Origin uncertain, but a very fine variety. Fruit large, and what adds to its value is the fact that it is a free-stone. It is a fine healthy grower and a good bearer. Should be in all collections.

Harrison's Peach—This most excellent variety also comes from Minnesota. The first is very large and oblong in shape, of a light mottled red color and very superior color. The tree is a very strong grower, of spreading habit and remarkably productive. You can plant it safely.

Van Buren—This fine plum originated in Van Buren county in this State

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and is a genuine American. The fruit is large, of a dark purplish red, and good enough for anybody. Tree is an upright and somewhat spreading grower and is quite productive.

Pottawattamie—This is another hybrid that originated in the banner county of western Iowa, and takes the name of the said county. The tree is a good grower, and is one of the most productive sort in the list. Fortunately the fruit is not very large, else the trees would be broken down with the immense crops which they produce every year. It is rather a new variety and is worthy of extensive planting,

Of the old varieties that are generally well known all over the State, I may mention Miher, Wild Goose and Forest Garden. These are all good roots if properly grown. A new variety that is now being disseminated by the writer of this is the Hawkeye. This is believed to be the most valuable variety in cultivation for the west and northwest. It is in *americana* family and the fruit is the largest that I have ever seen in that family. It is of a a light purplish red color, of extra fine quality and although quite new was much sought after in the market during the past season. The original tree has borne five crops in succession, which leads one to believe that it will continue to be an annual bearer.

I will also say that the following named varieties are hybrids of *chickasaw* and *americana* families and are very fine: Charles Downing, Milton, Esther, James Vick and Crescent City. The above varieties have not been disseminated as yet.

I may also mention here that I have fruited and tested over fifty named varieties of plums and the varieties described in this paper have proved the most profitable and valuable of any. It has been proved beyond a doubt, that if trees of the two familes of plums, *chickasaw* and *americana*, are planted in close proximity, they will bear much better than if planted separately. Many of the varieties are deficient in pollen, and if grown isolated, the the flowers are not properly fertilized, hence the result is a light crop of fruit. This is a subject that should be studied more than it is.

FORESTRY.

BY A F. COLLMAN.

We delight to get together and talk about planting trees, their beauty and value, their climate influence on man, stock and fruit.

We meet in our annual meeting as educators, to teach the country in which we live how to grow fruit, and fruit trees; how to plant and what to plant. We expect to get well paid for the time and expense of attending

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our annual meeting, but we hope to benefit mankind more, by telling them what to plant. We could all go back to our former homes and tell you of the homes made beautiful by the planting of trees. But we need not go back to the homes of our friends to see beautiful trees, for we can find them all over our fertile state. The planting of trees is no more an experiment, but an established fact that trees do grow and reward the industrious planter better than anything else he can do. Of course, every person should plant trees near his dwelling, to make home cheerful, for if we would keep our children at home to fit them for manhood and womanhood, we must make home pleasant and beautiful. In fact, home should be the dearest place on earth. And he should plant fruit trees enough to supply his family with all the fruit they want to eat, when fresh and ripe; and have it on the table 365 days in the year. It will not only take the place of hog and hominy, but we will have a fairer and healthier complexion; have richer and purer blood, and a brighter mind, a healthier body, and our children will grow up fairer and brighter around us; in fact, live on the food our Creator designed for us to eat; and he should plant trees for shelter and timber.

Our timber districts are cut down at a rapid rate, and it is only a question of time when lumber will be beyond the reach of many of our people for building purposes. Timber can be grown so easily and cheaply that any one can have all they want on their own farm in a few years, if we could only induce people to plant.

What and how to plant should be a subject ever before our Horticultural societies. I think every farmer should plant from five to ten acres of timber on his land. I do not favor planting soft and comparatively worthless timber, as some do, and yet they are valuable. But would plant largely European Larch, Red Cedar, Norway and White Spruce, Scotch and White Pine, Catalpa, Green and White Ash, Butternut, Black Walnut, American Chestnut, and many others might be added. Plant close, and cultivate thoroughly, so as to force a good straight growth, and take care of the plantation. Stock should not be allowed in the plantation, not even hogs. The trees should be pruned to a single leader, as high as you can reach, and you will be surprised how cheaply you can raise your own red cedar post.

By planting the above named varieties four feet each way, we can grow 2,722 trees per acre; and when said trees are ten years old they will be worth at least twelve and a half cents per tree, for they will average about twenty feet high. The Larch will make two posts, the Red Cedar will make one No. 1 post that is worth twenty cents in our State, and the others will be equally as valuable for other purposes, and at that very low estimate will be worth $340 per acre.

The cost of suitable trees of above named varieties and cost of cultivation for ten years could not possibly be over $100 per acre, which would leave $240 profit per acre. Now, a five-acre lot at that rate would be worth $1,200. At that age you can take off every other tree, a crop that is worth $850, and your plantation will be worth as much as ever. Then the plantation will take care of itself, and it is reasonable to expect at the age of twenty years our five acres will be worth $1,861 per acre, or $6,805 for the five acres, say

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nothing about the benefit we would derive from the shelter from our storms the songs of the birds and humid atmosphere which a grove of that kind would afford, which, in my opinion, whuld be about equal to the above estimate.

So let us all plant trees. They will break the bleak winds of winter, and will gladden all nature when spring bursts their buds tc bloom and foliage. They will refresh the earth with timely showers, the leaves will fall gently on our graves, and the winds through the branches will sigh a venerated memory.

VEGETABLE GARDENING.

BY J. M. RUSSELL, CORNING.

Now this is a subject that I had not expected or looked for until the programme was sent to me, but as we all have some duty to peform through life we should not shrink from our allotments.

Gardening is one of the essential necessities of every home, and it takes work and patience to raise one, and while I make these remarks you will say *I know it*, but I have got this to do and that, and I cannot attend a garden, but you can, and have good and fresh vegetables at all times in their season. An hour or two at a time, morning or evening, as the case may be, can be devoted to the garden, and there is no part of the farm that will repay you as well as a well kept garden, as in that you can have all the variety of vegetables that you may wish and have them fresh and pure.

Your garden must have a favorable location to make it successful, and you should study and select such varietie as will succeed best. I cannot tell you what each one of us must plant, for while one thing might succeed with me it might fail with you, and then you would think I had misled you, which I certainly would not do knowingly.

Now first, there should be a good asparagus bed in every garden. That is one of the first to start in spring, and takes the place of peas. Then you can plant your lettuce, radishes, etc., in their turn, planting the early varieties first, and then plant at intervals of about two weeks and you can have plenty at all times.

Cabbage and tomatoes should be started in a box in the house, unless you depend on a gardener for plants. I prefer to raise my own plants, as then you can set them out whenever you want to, and a few surplus plants is no inconvenience.

I plant all of my garden in rows, running the rows north and south, and

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make no beds, and begin on one side, and plant in my judgment, the best and earliest varieties, then in the middle the next early, and then the late on the other side, planting all in rows about fourteen inches apart, except peas and beans, which want to be about two feet apart.

Onions want a good rich location where it is nearly level, so that they will not be washed under, and still so that the water will not stand on them, and to be successful must be planted early, say any time after the middle of March and the ground is dry enough to work good. Always sow them with a drill, if one can be had, in rows fourteen inches apart; then keep the weeds out with shallow culture and weeding by hand.

Never sow any of your garden seeds broadcast but in rows, then with a hoe it is an easy matter to keep ahead of the weeds, and the hardest part is to clean the weeds out of the rows, which must be done by hand, and you have got to get right down on your knees, if it should be very weedy. The garden generally is the most neglected by the men of any part of the farm, and it is left to the women, which is practicably wrong. Still, if they want to help, all right, for it is hard work to make and tend a garden, so we should plant the best we can get, plant early and late, then with ordinary season we will have success.

PLUMS.

BY HENRY JONES, AFTON, IOWA.

Friends, if eating plums was the thing, I feel that I could do the subject justice, but will fall short in trying to write a good article on the subject of plums. I am very much interested in growing good plums and consider them one of the best and richest fruits we have and subject to very great improvement. In the early settlement of this country we found plenty of wild plums growing in almost every thicket, and they had plenty of good fruit nearly every year. We do not get such plums now, but if we go back and study the conditions we can have them now; in the first place the trees had very rich loamy soil to grow in, and it was not tramped by the hoofs of stock, and kept cool and moist all the year, if we plant them in good soil and plant them in thickets, give good cultivation while young and keep the stock out afterward, we will succeed now. I have succeeded in raising some very fine plums in the door-yard, both European and native plums. They receive the suds from the wash and all the waste water from the house. I raised Green Gage plums this year that were good enough for any one, and the trees were full; they are on their own roots. I do not think they will do for general planting, but for a few trees all could try them. I have

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been saving pits from all the good plums I can get and have them planted. I expect to get a great variety and can graft the best ones and plant an orchard of them; save pits from them and plant again by this plan. I expect to get some of superior quality, and to extend their season to three months. We must remember that many kinds will not do well if planted far away from others, and in thickets of many kinds we may hope for success. I expect to plant 4 to 8 feet. While bottom land and north slopes are the best for plums, they will do reasonably well on almost any place if the conditions are all right. I have rambled through as many plum thickets as any one I ever saw, and have studied their wants very closely, and got well paid for my trouble in choice fruit. The plum is very hardy to the far north, many trees here are thirty to forty years old and full of vigor. European plums do not live many years here, but pay for planting in favorable locations.

As my friend is expected to write some on plums I will not trouble you farther at this time.

REPORT OF MILLS COUNTY.

BY A. C. SABIN.

"Things are not what they seem" in horticulture this year in Mills county.

A very severe winter, no snow of any amount, and the driest spring I have ever known in south western Iowa, were fitting introduction to the hardest season on nursery stock, young trees and small fruits, that it has been my misfortune to experience. The sale of trees plants and vines were quite satisfactory in our county, but the results were particularly discouraging. I don't think that I am exagerating when I say that with the exception of grape vines, the loss was over 50 per cent of the plant. Grapes did not lose over 10 per cent.

On the small fruits the loss showed still worse as the season advanced. Spring planting did no good, and the strawberry crop was a fallure, nearly total.

Blackberries did much better, had an average crop of very good fruit, but when the blackberries came, the drought began to tell, and the size went rapidly down from fair to small, and quality poor. No good fresh, and still worse canned. I am more fully satisfied than ever before that good cultivation is the best manure for blackberries. Mulching is all right if you can keep the blue grass out, but if it once gets a foot hold, nothing will save the fruit. Cherries were a failure, the late frost took them as well as a good many of the plums. There were some Wild goose and Miner, and a very

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good crop of wild ones. Grapes did very well, not as large berries, or as heavy bunches, as they were the year previous, but the crop was the largest we have ever raised, the market for grapes was the most unsatisfactory of any of the fruits. It does no good to talk about commission houses, for I suppose we shall continue to deal with them, but the amount of shortage, stealage, (in transit of course,) repacking, overhauling and countless other shrinkages, leave nothing for the grower, but the privelege of raising the fruit. The grape crop sold for about 2½ cents, commenced shipping August 6th, and finished October 3d. Are better pleased with Pocklington and Vergennes every year, but after all the Black Grapes are the most profitable. I would still class the Niagara as promising. One of my neighbors, Mr. Willett, had a vine that had been set three years, and two years old when set that had 30 bunches, all fine. Mine did not do as well as that. I would not recommend the Niagara, unless purchaser would cover vine, as I do not think it will stand unprotected.

Mills county had the largest apple crop she has ever raised, fully 200,000 bushels, and the most of the winter fruit sold at 50 cents per bushel. Summer apples in the western part of the county are fairly profitable, and sold from 25 to 50 cents per bushel. The apple crop as a whole has been the means of bringing in a good deal of money into the county. The worst thing we have to contend with is the Codling moth, fully half of our apples are wormy. In vegetables, the crop was light. Early potatoes did fairly well around Glenwood; there are a good many potatoes raised, and we are convinced by experience that early planting and heavy seeding are two of the essentials of success. In potatoes leading varieties are Early Ohio, Early Harvest, Beauty of Hebron, Crane's Potentate and Mammoth Prolific, all of *very* good quality except the last. The tomato crop was good, ranging from 75 to 250 bushels per acre.

The planting of orchards still goes on, the inclination of planters is towards better varieties. There being more inquiry for Jonathan, Grimes Golden, Wine Sap and Rome Beauty, in preference to Ben Davis, Rawle's Janet, Romanite and Pearmain. The Duchess is quite popular and in our county much more profitable than Astrachan, although the Astrachan is the better apple.

In raspberries we are still planting Tyler or Souhegan and Gregg. Some call for Ohio and Hopkins in black, and Turner, Cuthbert and Shaffer's in red. This spring our Shaffer's were killed to the ground, but the new canes of this seasons growth gave us half a crop. Where no other red would do it; this is one point in which I think it is superior to any other of the reds.

We have nothing to recommend to supplant the Snyder and Taylor in blackberries; are trying Erie, Stones Hardy and Ancient Briton.

The condition of orchards is fair, there has been considerable loss among the older trees, also amongst Ben Davis, Willow Twig and Jonathan, but not sufficient to cause us to be discouraged. Cherries are gradually loosing ground, and we can expect to succeed only by continual planting. Ostheim and Montmorency promise better no wthan Richmond and English Morello.

In plums more of De Soto, Forest Garden and Wild Goose are set and less

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of Miner. Miner has not proved at all profitable. It may be because it has been to much isolated from other kinds.

Your attention is invited to our county exhibit which Mr. J. W. Murphy has kindly consented to take charge of it; is not near as full as it could have been if preparation had been made in season.

OUR NEEDS.

A good winter apple that will keep till May. A cherry that is of good size, thick leaf and healthy bark that you can eat off from the tree. A pear that is as good as the Bartlett and wont blight.

A plum as good as Coe's Golden Drop that the Curculio wont string.

A raspberry as large as the Gregg, early as the Tyler, and as good as the Dootittle, when it was first planted.

A grape as early as Moore's Eearly, and as large, and equal to the Delaware, in quality that will keep with Cataba.

"Give us these, brethren, and we will ask for more." But now we feel very modest and so will desist from asking except for these.

REPORT OF PAGE COUNTY.

The past year has been a very discouraging one to the fruit grower and has not proved profitable as far as dollars and cents are concerned, but we have been enabled to get some valuable experience by paying well for it.

The strawberry crop was almost a failure caused by the drouth. Charles Downing did better than Crescent with us. As the latter did not seem to be propperly fertilized the berries were knotty and failed to fill out as they usually do. Where plants were put out early and well cultivated, they went through the trying season very well, making many strong plants after the rains came, and as far as we are able to judge are in good condition.

Currants and gooseberrias bore very little fruit. Red and White Dutch, White Grape and Victoria being the varieties mostly planted. Fays Prolific promises well, but owing to high prices but few have been planted of the latter Houghton and Downing are the varieties cultivated, both have done well heretofore.

Cherries set very little fruit in this vicinity, but in the southern part of the county they did better, some having a fair crop. Early Richmond and English Morello are the only varieties bearing. Very few sound healthy trees in the county, those twelve to fifteen years old are either dead

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or in a worthless condition. Are planting some Wragg, Montmorency and Ostheim.

Raspberries were injured some by winter, but promised a fair crop until the time of ripening when they had to yield to the intense heat and drouth. Gregg, Hopkins, Souhegan and Tyler are the black caps mostly planted. Turner and Cuthbert both do well when properly cared for. Ohio has not fruited with us yet but promises well.

Snyder blackberry is the king of berries in the Kingdom of Page, and we are unanimous in voting another star for its crown for withstanding so bravely the intense heat and unparalelled drouth of the past season. All promised well for a fair crop until about July 1st, when they commenced to dry up and it took but a few days to finish the crop. I think fully 90 per cent of the berries in the county dried on the canes. Those that were picked brought 10 cents per quart on the home market. The canes seem to be in good condition so far, and if we have a favorable season next year we are sure the Snyder will not disappoint us. We have tried Stone's Hardy, but it has been badly injured by winter for the last two years.

Concord grapes done well, bearing a full crop of fine fruit, better than for several years. We fruited Worden for the first this year, and are well pleased with it. It is ten days earlier than Concord and of superior quality. Niagara is growing in favor.

Plums, except Wolf, were almost a failure. Have heard of a few instances where Miner bore a fair crop, but have seen many trees of the Wolf well loaded with fine fruit, and on our own grounds they were full, while DeSoto within a few feet failed entirely.

Apples for hardiness and productive, Duchess still heads the list, bearing a full crop the past season. Red Astractian, a very light yield; Benoni does well in timber soil, but blights on prairie. Wealthy and Haas promise well for fall varieties. Ben Davis and Jennett head the winter list this year Jonathan doing well in some localities, but I think fully two-thirds of the winter apples gathered were Ben Davis. All varieties were smaller than common, caused by the drouth. Fruit dropped badly during the summer and in some orchards very few specimens escaped the ravages of the codling moth.

Evergreens—Red Cedar, Austrian Pine, Scotch and White Pine, Norway Spruce—all stood the drouth better than Balsam Fir; many of the latter died during the last year.

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REPORT ON FRUIT CROP; CASS COUNTY.

BY R. D. M'GEEHON.

After another severe winter, and one of the dryest summers known, we could not expect a very good crop of fruit, yet of some kinds of fruit the crop was a fair one. The strawberry crop in many places was nearly an entire failure; and in no case over half a crop, Crescent Seedling producing at least three-fourths of all the strawberries there was in our market. I fruited about one acre, planted the spring of 1886, and picked only about 530 boxes berries of poor quality, many of them being about cooked by the hot sun, dry hot winds and lack of rain; although the crop was poor, the price was only 10 to 12½ per box.

Raspberries, some places, was a fair crop, while others they were poor. On my grounds, Mr. Ira Needle's and Mr. Silas Wilson's the Tyler, Hopkins, Ohio, Gregg, Shaffer and Johnson Sweet, all had a very fair crop. My Ohio had a *very heavy* crop. As I now have thoroughly tested this variety I consider it one of the best (if not the verybest), Black Cap we have got for a profitable market berry. Johnson's Sweet is the best flavored and sweetest Black Cap I know of, and as hardy and about as productive as any. The Shaffer still continues to produce good crops of the largest berries grown, and of *excellent* quality for canning; they also bring the highest price in our market, which runs 15 to 20c; others brining from 10 to 15c. None of the Red varieties, such as Turner, Thwack and Cuthbert, amounted to much with me, the tree cricket having bored the canes about to death, while some others that had small patches of Turner had good crops.

Blackberries were generally a very poor crop, many patches the canes were badly injured by previous hard winter—then the dry hot summer did the balance. I had about one-half an acre planted two years ago, which produced a good crop of excellent berries, but few of the canes being injured by previous winters. I cut them back severely in the spring and commenced cultivating them as soon as ground was in good condition and continued it occasionally until the fruit began to color. I also done the same with my raspberries, which I believe helped them to resist the drouth very much. My old blackberry patch planted eight years was not worth picking, which was the case with most old patches in the county. Why the severe winter

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should damage the canes of old set plants so much worse than those set two years, is a qcestion I have not been able to answer yet, and don't know that I will soon.

Currants and gooseberries, there was none to amount to anything of either. What few Early Richmond cherry trees there is left had a few scattering cherries on. English Morello the same.

Plum crop was nearly a failure. There was a few wild plums; but hardly enough of tame ones in market to establish a price.

The grape crop was more than an average crop in quantity, and the quality was supesior to anything we ever had; all varieties seemed to be on their best behavior.

I visited Mr. Silas Wilson's vineyard about the middle of August and saw about twenty-four varieties in their full glory, it was as fine a sight as I ever saw. There was the Worden, Moore's Early, Janesville, Cottage, Delaware, Agamawa, Dracut, Amber, Lady, Martha and Pocklington, besides many others, loaded down with fine clusters of black, red and white grapes suited to all tastes.

Mr. Wilson sold his Moore's Early and Worden for ten cents per pound for his first pickings, and five cents for the last, while Concord was only worth three cents when they were fully ripe—as Moore's Early was all gone and Worden about gone when Concord got fairly into market.

There was the best exhibition of grapes at our county fair there has ever yet been in the western part of the State—if not the whole State. Mr. Silas Wilson had twenty varieties, Mr. T. J. Hardenburg ten, Mrs. B. Campbell five varieties, Mrs. Nichols two varies—thirty-one different varieties in all.

Our apple crop was only a moderate crop, and ripened so early that many winter varieties were early fall. I tried to keep some Wealthy for our fair (September 7th), but they were all rotten before that time. The Red June had a partial crop, also Red Astrachan; while Duchess and Lowell were well loaded, Talman Sweet, Winesap and Genitan, all had good crops on, Willow and Ben Davis (where Ben Davis had life enough left) bore a partial crop, Roman Stem a fair crop. About all varieties that were in bearing condition had some fruit on.

FIGHTING THE CODLING MOTH.

BY CLARENCE M. WEED, CHAMPAIGN, ILL.

I have been assigned the subject of Horticultural Insect Enemies, but I must confine myself to a few notes on a single one of the legions of insects

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which afflict the horticulturist—the codling moth. This is by all odds the worst of orchard pests, and one which annually destroys millions of dollars' worth of fruit in the United States. It has been known in Europe from time immemorial, and probably was introduced into this country before the first orchard here had ceased to bear. The story of its life is soon told: A small chocolate brown moth appears in the orchard in the spring, just after the blossoms have fallen from the forming fruit, and deposits on the upper or calyx end of the apple an egg from which soon hatches a minute worm that bores inward toward the core of the fruit. Here he continues feeding for a few weeks, when he leaves the apple, finds some sheltered crevice in the bark, and spins a silky case called the cocoon. Within this he changes to a chrysalis, and about a fortnight later emerges as a moth. There are two, and perhaps three breeds in a season in the latitude of Iowa and Illinois.

Until quite recently no practical remedy was known for the pest. Bands and various traps were frequently recommended, it is true, but all such remedies were necessarily incomplete and unsatisfactory. But within recent years some one thought of a brilliant and seemingly dangerous method of fighting the enemy, namely, that of poisoning the worms just as potato bugs are poisoned. Who first used this method I cannot learn, but it was practiced in western New York, I believe, several years before public attention was called to it. Early in the present decade, however, the plan was described at a horticultural society meeting, at which Professor A. J. Cook of the Michigan Agricultural College, was present. The professor was favorably impressed with the idea, and the next season experimented in a small way to test it, the results being so satisfactory that he recommended the method at various meetings, and made other experiments in succeeding years. Apple trees were sprayed early in May; and to test the possibility of the poison remaining on the gathered fruit some of it was submitted to an eminent chemist, who reported that no arsenic was present.

During the summers of 1885 and 1886 Professor S. A. Forbes of Illinois, took the subject up, and conducted an elegant series of experiments to learn the exact ratios of apples saved from codling moth injury by the application of insecticides. These experiments were conducted with great care, under varying conditions, and involved the separate examination of more than 40,000 apples. But the work was well worth the doing, for it was shown beyond doubt that at least seventy per cent of the loss commonly suffered by the fruit grower from the ravages of the codling moth or apple worm may be prevented at a nominal expense, or practically in the long run, at no expense at all, by thoroughly applying paris green in a spray with water, once or twice in early spring, as soon as the fruit is fairly set, and not so late as the time when the growing apple turns downward on its stem.

Finally these results have been abundantly confirmed the present season by some of the leading orchardists of Illinois. In the Centralia region, such well known practical men as Hon. B. Pullen and Mr. Jabez Webster, have tried it with gratifying results; and in the great fruit region of Hancock county, Secretary A. C. Hammond of the State Horticultural Society, has

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been equally successful. In a recent letter Mr. Hammond writes: "I have just been gathering the apples from an orchard which was sprayed twice with London purple, and have between 400 and 500 bushels of high colored, perfect fruit, while from the same number of trees not thus treated I cannot pick a bushel of perfect apples. And if all the perfect apples within ten miles of me were collected, they would not make as many bushels as this orchard, which seems to plainly indicate that there can be no other cause for my success."

MODE OF PROCEDURE.

Paris green shold be used not stronger than a pound to a hundred gallons of water, and London purple at the rate of a pound to one hundred and fifty gallons of water. In a recent circular Professor Forbes gives the following practical directions:

APPLICATION.

"In orchard work, two men are required, with a team and wagon, and a hand force-pump with a spray nozzle and a sufficient amount of stout rubber tubing to reach from the pump to the top of the highest tree. Fasten one end of the hose to the discharge pipe of the pump and insert the nozzle in the other, tying this to the end of a light pole long enough to reach the top of any tree in the orchard. One man drives from tree to tree and manages the pump while the other directs the spray. If Paris green or London purple are used the fluid must be frequently stirred to keep the poison from settling. The fluid should be thrown in the finest spray which the nozzle will emit freely, and applied until the leaves begin to drip.

TIME OF SPRAYING.

"The first spraying should be made when the apples are about the size of peas. If heavy rain occurs within a week or ten days, the spraying should be repeated.

PRECAUTIONS.

"To prevent the too free exposure of the workmen to the poison, it is best to be applied when the air is still or from the windward side of the tree.

"Stock must not be allowed to run in the orchard until heavy rains have washed the scattered poison into the earth.

"The trees should not be sprayed after the apples have grown large enough to turn down upon the stem."

In conclusion I can only urge the horticulturists of western Iowa to practice this simple and effective remedy. I am sure that those who once try it will continue in the good work, and that by its use millions of bushels of fruit that are now wasted might be saved.

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TAYLOR COUNTY HORTICULTURAL SOCIETY.

ANNUAL MEETING DECEMBER 16, 17, 1887.

Society met in Excelsior Grange Hall near Lenox.

R. G. Moon, President, Geo. Van Houten, Secretary.

Several important papers were read and discussions had.

It was the intention of the society to have full proceedings in the annual report of the Iowa State Horticultural Society; but limits of report having been fixed by the State society, this short notice only has been offered.

One feature of this meeting may be of interest to county societies; and that is, that the evening session was a public entertainment, engaging the services of the young as well as the old. The exercises consisted of music, recitations, dialogues and declamations.

The last day was devoted largely to discussions of varieties and the adoption of a fruit list. This list was quite lengthy as compared with lists of societies farther north, the favorable location enabling the fruit grower of Taylor county to plant with confidence varieties that fail even a short distance farther north.

The fruit display was fairly good, especially of apples, R. G. Moon, G. W. Green, Geo. Van Houten, H. Cade and others contributing.

Officers elected as follows:

R. G. Moon, President, Bedford, G. W. Green, Vice-president, Conway; H. Cade, Secretary and Treasurer, Lenox.

The society will meet on call of President and Secretary.

GEO. VAN HOUTEN.

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Proceedings of the Eastern Iowa Horticultural Society.

HELD AT DAVENPORT, DECEMBER 7 AND 8, 1887.

FIRST DAY—MORNING SESSION.

Society called to order at 10 A. M. by President Osborn.

Session opened with prayer by Geo. Van Houten.

Prof. Witherel, of Davenport, gave the address of welcome, briefly stating the arrangements for the meeting and accommodation of visitors, enumerating the many attractions of the city and surrounding country, and at once making the visitors feel at home and in good humor.

President Osborn replied in a very appropriate manner.

For want of room both of these last excellent speeches are left out of this report, and for the same reason many of the papers have been cut down one-third to one-half.

PRESIDENT'S ADDRESS

Fellow Members and Friends of Horticulture—Another year has passed since this Society met in the beautiful town of Grinnell. There we held an interesting and profitable session in listening to the many valuable papers upon the various branches of horticulture, and discussing the same, which brought out varied experiences in our work among the members of this and other similar societies that were present with us. We have come together again here in one of Iowa's oldest towns; one that has a valuable history in the past full of thrift at the present time, and awake, and on the alert for the future,

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where also many of Iowa's oldest workers in the cause of horticulture reside, and from whom we expect to hear at this meeting of the results of their labor in the past, and at the present time we are well aware that great changes have taken place since the first garden was made and orchard planted in this community. In the earlier days of orcharding all was bright and hopeful. But now the orchardist is moving slow, and in deep study over failures; perhaps experimenting with new fruits or giving up in discouragement. While many believe that we are making progress, though slowly. The horticulturists of Iowa have found by the past that we cannot depend upon those varieties of fruit brought from our sister States, though they have been successful in their climate and on their soils. On our soils and in our climate they have not. This has led us to investigate as to the origin of those varieties that have been tried here, and in this investigation we find that out of the vast multitude that have been produced in other States only a very small per cent (not one in a hundred, yea, a thousand) that are of any value for general planting there in their original home, and when we consider that those States have been at work from one to two hundred years, producing the few valuable varieties they have, can we of the northwest or Iowa, expect to produce an apple at once that is perfect, and at home in our varied climate and rich vegetable soil. With these facts before us do we not see that we cannot longer delay the originating by a systematic course of such fruits as shall meet the wants of Iowa, and trees that will live in our soil.

In corresponding with many of our horticulturists, I have noticed that there is a general conviction expressed in their correspondence that if we reach success it will come in that way, and for the encouragement of our horticultural friends I think I may say that we have a fair start in that direction.

First—The large number that are now planting selected seed; others crossing by fertilizing with different varieties.

Second—By the advance step taken by our State Society in this work, by the offer of liberal premiums for the production of worthy fruits, also in establishing so many experimental stations to aid in determining the value of all such new productions. It has taken years to create a coviction in the minds of the people that there is a necessity to engage in such a work. The The lessons of the last forty years of experience in Iowa will aid in the further prosecution of this work, and teach us to use such stock and only such as has given promise of success.

Judging from the reports I have received from some of the experimental stations they are making advancements in testing such new varieties as we now have. We are evidently still behind the horticulturist of Oregon. I quote from an Oregon paper the following: "At Walla Walla H. S. Blandford's experimental garden is crossing strawberry plants, sugar cane and milk weed to produce a new specie of vine, which will grow sugar and cream in connection with strawberries." It is to be hoped that if our Pacific friends are successful in such crossing that our Iowa horticulturists will feel encouraged.

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Permit me to call your attention very briefly to a few notes quoted from the *Century Magazine*, September number of 1887, on pages 792 and 793, in regard to longevity of foreign trees that have been planted so largely in this country. For instance, the Norway spruce, "a nice and beautiful tree while young, grows very rapidly, very tempting to planters." But Prof. Sargent, of Massachusetts, says its very general planting must be regarded as a public misfortune; in spite of its early promise years ago, with age it is a complete failure. Again, Mr. Robert Douglas, of Waukegan, Illinois, one of the oldest and most widely known nurserymen in the country, says he speaks with a sense of responsibility, having grown more Norway spruce than any other man or all other men in America, adds that they are short-lived in this country; that he made a journey to Canada, expecting to find trees there planted more than forty years ago vigorous and healthy; but to his surprise they were all dead. And in regard to the Scotch pine, which he values so highly as a windbreak on the prairies, but as to long life and a timber tree he pronounces it an entire failure; and his statements are fully confirmed by the Massachusetts report of them there. With decideous trees the case is similar. Lindens, ashes, oaks, sycamores, and other varieties that have been largely planted, grow rapidly at first but soon begin to fail. As the climate of eastern Asia is much more like ours than that of Europe, one is not surprised to find the trees which have been brought from there giving a better account of themselves.

Mr. Fuller, of New Jersey, who is largely engaged in growing all varieties of trees, says, "that the native trees of that locality succeed far better than any brought from other localities."

I must not enlarge my paper in entering upon the discussion of various fruits, as we are to have a number of practical papers upon the different varieties as to their real value for future cultivation, and it would not be right for me to take the time belonging to them. I think it is a source of encouragement that our scientific men are engaging in making investigations as to soils and the structure of leaf and wood that constitutes our trees. Yet we cannot let go for a moment the real practical work of raising seedlings.

As to the condition of this Society, I can safely say that it is prospering. There is a deeper interest felt among its members of the value of these meetings; its membership is increasing, and to still further increase the interest of these meetings is the want of funds to offer as premiums. I would recommend that this Society ask of the State Society an appropriation of fifty dollars annually for that purpose. I further recommend that the board of directors make a more definite arrangement with our Secretary as to his work, salary, etc.

In closing, let me say I find a growing interest in the work of our horticultural societies, the many valuable papers read and discussed at these meetings and published in connection with similar societies in our annual State report is being more and more sought for and appreciated.

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On motion, the recommendations contained in the President's address were referred to a committee consisting of Messrs. Strohm, Fluke and Williams.

Mr. Holmes: Are any of the Walla Walla plants for sale?

No answer.

The President appointed Messrs. Strohm, Rackster and Langham a committee on premiums for display of fruits, trees and flowers.

RASPBERRY CULTURE.

BY C. KATZEL, BLAIRSTOWN.

When I commenced two years ago last spring on my five acre farm, I planted about one and a half acres in rapberries and blackberries, only about 300 of the latter. Like most beginners, I commenced with great expectations, not counting on winter-killing, late frost and drouth; but that did not matter much, for all these came anyhow. The mistakes, I think, I made were, not planting quite deep enough, for the heavy winds blew many over before fall; in not planting close enough in the rows, and in my selection of varieties. If I had planted mostly Tyler and Ohio, I would have done a great deal better; but I planted mostly Gregg and a kind which turned out to be a worthless seedling. The Gregg was to some extent winter-killed. For red, I planted the Cuthbert, which, taking everything into consideration, has done well. I planted a few of the newer kinds, as Crimson Beauty, Rancocas and Marlboro, but could not recommend them yet to be largely planted, although they had not a fair chance on account of dry weather. I also planted a few Thwack, which is a nice berry, but seems to be not so good a bearer as the Cuthbert.

Now, when I write of close planting, I have in mind a five acre farm, where a man has to make the best of it. It may be different on a large fruit farm.

I will plant only three feet apart next spring in the row and about five inches deep, filling up during summer, and seven feet apart in the rows.

Another mistake I made was in not replacing in the fall or the next spring the missing plants. I thought they would fill up the vacant space, but they sprouted in all directions save where they were wanted, and some rows are not filled to-day. I also allowed the canes to grow to high before pinching off, giving too much chance for the wind to blow them over. The canes ought to be pinched off when about two and a half to three feet high. This I say of Black caps. My red ones I pinched back last summer a year ago,

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but as they were growing so late in the fall most of these laterals were winter-killed, and the berries I got grew mostly on the main canes, so I let them grow last summer, and have a good stand, and if the tops should be killed by frost there will be enough left to bear a good crop.

Of course, I may be mistaken in my idea, which time will show. Experience is a good teacher, only sometimes too costly for a poor man.

These two last summers have been against me on account of dry weather, but the berries I raised were good in quality and large in size. What made them so? Having been a large grape grower on a small scale for the last twenty years, I treated the raspberries on the same principal, planting close and trimming close, and have been successful in raising large bunches and large berries.

I often felt very small last summer when I saw my neighbor fruit grower haul his cases by the wagon loads to the depot from his eight acres of raspberries, while I could almost have hauled mine in a wheelbarrow; but I sold mine all at home and got a shilling a quart for the black and fifteen cents a quart for the red berries through all the season; and that was what kept me above the water, for it is not the quantity but dollars and cents that count. And I have often thought if all the fruit growers would try to grow for the home market, we would get better prices abroad.

Deeper and closer planting, close trimming, a good selection of varieties, good cultivation, and success will crown our efforts.

DISCUSSION.

Mr. Rackster: I advise planting not less than six inches deep in rows eight feet apart, and plants two and one-half feet apart in the row. I also advise fastening the tips down, when wanted for new plants. The object is to have plants thick in rows, with rows far enough apart to work between. The tips will grow and do better than plants set either fall or spring. It was stated that if tips were not severed from plants until spring the canes would winter better. Had to trim off Doolittle and Souhegan last year, in rows planted seven feet apart. Would pinch off early varieties at two feet. Gregg and Improved Doolittle for black, Cuthbert for red. If tips of Gregg can be got to root by being left until spring they will winter well, but if tips are removed or severed from the canes, winter killing may be expected.

Mr. Osborn: What variety is best?

Mr. Rackster: Improved Doolittle, Souhegan and Cuthbert. The Gregg will not winter-kill if you get the tips to the ground.

Mr. McCagg: I have better success in planting eight inches deep. I agree with Mr. Rackster in the other distances. I prune only once

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when the berries start, cutting back to from two to two and one half feet.

Mr. Willard: My Gregg winter kills. The Hansel is good, a better berry to handle and to cultivate, but my most prolific varieties are the Souhegan and the Gregg.

Prof. Witherell: I believe it is a mistake to trim the red berry too close. I rather have a tall, healthy plant. I leave some of the old wood to assist in holding up the new canes.

Mr. McCagg: I want my red raspberries on poor land.

Mr. Willard: Poor land will do for the Turner and Cuthbert, but not for the Gregg. I never trim red raspberries except to cut tips back in spring.

Mr. Rackster: I succeed best on rich land. The canes may winter kill, but I get larger crops on manured land.

Prof. Witherell: Can we get a late fall berry?

Mr. Van Houten: A boom has been started on these late varieties. Horticulturists should sit down on this practice; it don't pay. If Shaffer are cut down early in the spring, the new canes will produce a crop of berries in the fall, and some claim that the Eureka is nothing but the Shaffer. The Ohio Everbearing and some other varieties produce berries in the fall, but being out of season there is not much demand for them and they have not proven profitable.

Mr. Mead: I plant the Doolittle and the Gregg. The Turner is very satisfactory. It suckers badly, but we cut them out as we do weeds.

FIFTY YEARS OF HORTICULTURAL WORK, AND WHAT HAVE WE GAINED?

BY ENOCH MEAD.

As one of the oldest members of the Society engaged in horticultural work, and as this may be the last article that I shall prepare for the Society (being now almost an octogenarian) I have chosen the above subject as one suitable to present on the present occasion.

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My experience in horticultural work dates back to the days of my boyhood, at the old homestead in the southwestern part of the State of Connecticut. It was there my first lessons were obtained, but my education was not completed I have been adding to my stock of knowledge then obtained to the present time, and now with all my experience and observation I find that I have much to learn. The great field of knowledge on horticultural subjects is but partially explored.

On the 10th day of October, 1837, I left my eastern home for a trip to what was then known as the great "Mississippi Valley," intending, if I found a location that pleased me, to make it my future home. After drifting with the current of emigration for some two months toward the setting sun; I found myself, just fifty years past the present month, on the west bank of the Mississippi in the central part on the river, of what is now the great State of Iowa, but at that time a part of Wisconsin Territory.

After a brief survey of the county I decided that I had found a place good enough for anybody to live in. Acting upon this decision, I purchased a squatter's claim to lands near the river, four miles below what is now the large and flourishing city of Davenport. At that time the land was not in market, and titles to real estate were somewhat uncertain. My purchase consisted pretty largely of timber lands, some of the venerable oaks and elms measuring from four to seven feet in diameter. At that time nobody thought of making a home on the open prairies, on account of the want of timber and the exposure to the fierce blasts of winter. This it is to be remembered was before the introduction of railroads and coal and lumber from the pineries of the north. From inquiry and observation I soon learned that this must be a good fruit country, as wild fruits of many kinds were abundant. Among them, crab apples, grapes, strawberries, cherries, raspberries, blackberries and others. These wild fruits were utilized by the first settlers. Crab apples, which could be gathered by the wagon load, were used to some extent, the same as cultivated fruit at the present time, but their principal use was in the manufacture of vinegar. The grapes were mostly of the variety known as frost grapes, and although not very valuable for eating, made a very good wine, and were gathered in large quantities for the purpose. They were most abundant on the islands of the Mississippi, growing to the top of the highest forest trees. In order to gather them it was necessary to fell the tree. Thus the noblest specimens of the forest were destroyed for the fruit on their topmost branches.

Wild strawberries were also abundant. Not the Jessies and Bubacks of the present day, but of excellent quality, and so far as I remember resembled the Crescent, now considered so valuable. Many a basketfull of this delicious fruit have I gathered, with wife and children. But they soon passed away. This is true of most of the wild fruits, a natural result of the settlement of the country.

Having provided a home for myself and family and opened up a few acres for cultivation, I decided to make my early education in horticultural work of practical account, and up to the present time have devoted what time and labor I could spare from other duties in this attractive pursuit. My

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object always has been to secure and plant only the most valuable varieties at whatever cost.

During my half century's residence on this place where I first stuck my stakes, I have experimented with about all the so called best varieties of fruits, large and small, that are adapted to this latitude, and with a reasonable degree of success. The first years of my experience were more successful than have been the last. At first we had no insect enemies (these pests of the orchard) to contend with. Apples, pears, peaches and quinces could be grown without extra care, and the fruit of the finest quality. In those early days peaches with me were so abundant that I often left them to perish on the ground. The climate then seemed much more favorable to the horticulturist than at present. We had some cold winters, but our trees generally came through all right.

For many years past there has been a gradual decline in our orchards, until now we find disasterous failures almost everywhere. The severe winters of the past few years, connected with excessive drouths, has much to do with this loss, but not all. In my opinion atmospheric changes from warm to sudden cold (influence beyond our control) have much to do with it. And this condition, judging from the appearance of this winter so far is likely to continue. I have faith in the future of horticultural work in our State. But my hopes lie in the direction of introducing hardy ironclad varieties, in place of those that have failed us. The past season I have added to my apple orchard more than 100 trees of the most hardy varieties, and have planted some thousands of strawberry plants, hoping that others will profit by the same if I do not.

My first apple orchard was planted in 1840. The trees were grown in Richmond, Ind. The varieties were such as were commonly grown at that time in the West. There were 21 varieties. Among them were Bellflower, Rambo, Romanite, Seek No Further, White Winter, Pearmain, Summer Queen, Swaar, Early Harvest and some of the Russetts. These trees soon came into bearing and for several years were loaded to their utmost capacity with the finest of fruit. This orchard was the wonder and admiration of all who saw it. Not one tree of this plantation failed to produce a full crop. These trees lasted about 20 years. Another lot of trees, planted in 1850, being mostly of the same varieties, proved quite satisfactory, but not equal to the first plantation.

In 1872 I purchased 1,000 trees in Rochester, N. Y., and southern Illinois. Among those of that lot that have been profitable are the Fameuse, Maiden's Blush, Benoni and Duchess of Oldenburg. Willowtwigg, Ben Davis, Canada Red, Dominie, Winesap and Jonathan have not been profitable. They are rapidly dying out. Of my apple orchard I may say that it has paid me as well as any other investment on the farm.

In regard to pears and peaches, I would say that I have planted them by the thousand; at this time but few remain, and from these for several years I have got but little fruit. Peach trees are winter-killed, and pear trees are destroyed by blight. Even the Kelfer, so largely advertised a blight-proof, has suffered with the others, and in this section is not worthy of cultiva-

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tion. There is an impression among the weatherwise that the old climatic conditions of fruit-growing will return again, and that the peach and the pear will be a success, as was the case some twenty or thirty years past. It is to be hoped that their predictions may be fulfilled.

In regard to the small fruits, I have to say that I have experimented with many of the new varieties and find great advance in the last half century. For example, I mention the Concord grape. I have had this grape for many years and find it hardy, of good quality, and producing more fruit with less labor than with any of the newer tried varieties. Many of the new grapes will suit amateurs, but this is the grape for the million. We owe the originator of this grape a great debt of gratitude.

Of cherries the Early Richmond is my choice. Have cultivated many others, but have not found them equal to this.

In regard to strawberries, raspberries and blackberries, there are so many new and valuable varieties constantly introduced that we can scarcely mistake in making a selection. I make it a rule to procure specimens of the new kinds of fruit annually introduced, acting upon the precept, "prove all things and hold fast to that which is good."

The past fifty years since horticultural work was commenced in our State has been the most fruitful in improvements and new discoveries, of any similar period in the history of the world. The knowledge of fruit culture has advanced with other industries. Unlike work in many departments, there is no limit to improvement in this. One step in advance leads to another, and thus progress may be made until the end of time. Any person introducing a new variety of fruit adapted to our climate is a public benefactor and will immortalize himself.

We have learned from the past that the old varieties of fruits, successfully cultivated by the pioneer fruit growers, cannot be depended on in the future. The stock seems to have lost its vigor and vitality from some cause. I ascribe it to continuous grafting and re-grafting upon degenerate stock, unable to bear the severity of an exacting climate. Horticulturists now, all over the country, are looking in new directions for a stock of trees suited to our climate. Importations in large numbers and of great variety have been made from the frozen regions of the north, so far with a promise of success. There is another direction to which I look for better results, and that is the planting of seeds from the best and hardiest of stocks, and grafting upon seedling stock varieties that have proved iron-clad in our climate. Thus in time we shall get a new race. In fact, we already have seedlings of great value, and these, with the additions that are constantly making, will, it is believed, in a few years enable us to re-plant our orchards with stock that will prove hardy in our exacting climate.

Another thing of almost equal importance that we have learned in the past, is the method of destroying the enemies of our fruits. These enemies have increased upon us until the losses by them count up into the millions. Many methods have been devised to combat these enemies of the orchard and garden. The most successful appears to be spraying trees and plants with poisonous preparations of arsenic, kerosene and carbolic acid. These

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are effectual in experienced hands, and if generally applied would accomplish the object desired. But few, if any, but professional fruit growers will apply this remedy, hence we need legislative enactment on the subject. It should be made compulsory, the same as trimming the hedges on the highway. California, Michigan and parts of New Jersey have such laws, why not Iowa? There is a new energy now being developed that may come to our aid in this work, and that is electricity. Experiments are now in progress to determine the effects of this agent on vegetation, and who knows but the time is near when this all-penetrating influence will be used in our warfare against insect enemies and in developing our finest fruits.

Friends in horticultural work, my time for acting with you is nearly at an end. I have pursued my work in sunshine and shade, always hopeful in regard to the future, and if I could renew my age and live over again the last fifty years I would devote a large portion of my time to horticultural work. I have great hopes and expectations from the work of our society. Our progress may seem slow, but it is nevertheless sure. Most assuredly we are working in the right direction.

On motion Mr. Cully was made an honorary member.

The society tendered a vote of thanks for the able paper read by Mr. Mead.

On motion the secretary was instructed to send the following telegram to the Northern Society now in session at Hampton, Iowa:

"Greeting to the Northern Iowa Horticultural Society. May you have as pleasant and profitable meeting as ours promises to be.

EASTERN IOWA HORTICULTURAL SOCIETY.

WEDNESDAY AFTERNOON.

Invitation received and accepted from Chas. E. Harrison, President, to visit Davenport Academy of National Sciences.

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STRAWBERRY CULTURE.

BY CHAS. W. MANSON JR., MARION.

Strawberry plants can be successfully put out either in the fall or spring time, but for general planting the spring is preferable. Sometimes it is more convenient to plant in the fall, in which case it is better to do so; but the difference in the first year's yield between fall-set plants and those set in the spring is not sufficient to pay the expense of the covering which must be given the fall-set plants to prevent their being heaved out of the ground by the winter's frosts.

The soil for planting should be deeply plowed, being thoroughly prepared and enriched, and the plants set from 12 to 18 inches apart in the rows, according to the natural tendencies of the varieties planted to throw out runners and cover the ground. The rows should be about four feet apart which gives plenty of room for plowing. The beds should be kept mellow and free from weeds by frequent plowing and hoeing. In our experience we have found the Planet, Jr., cultivator to answer the purpose for plowing better than anything else, since it permits cultivating so very closely to the plants without disturbing them, and it leaves the ground smooth instead of in ridges.

It is a good plan to make calculations on getting two or possibly three crops from beds and then plowing them up, while other beds which have been started in the meantime will be ready to take their places.

It is less work to start new beds than it is to properly clean out old ones, and the fruit from vigorous young plants will be far larger and better than can possibly be obtained from old ones.

The most profitable way is to thororoughly cultivate during the year when first planted. Then cease cultivating; gather the fruit for about three crops, after which plow up. The beds, however, should be covered with straw in the winter, and the second and third years it is well to scatter well rotted manure or bonedust, fertilizer, etc., over the patches. Salt sown like wheat on beds is also good, and besides its value as a fertilizer it helps to drive away the grubworms which sometimes become very destructive.

We believe there is no kind of crop which will give better returns for manuring than the strawberry. The manure should be applied to the ground

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before the beds are planted. If put directly on the beds of plants considerable care should be taken to secure that which is well rotted and free from grass and weed seed, for in this section of country the blue-grass is the worst enemy of the berry patch, and few patches can be kept free from it more than three years unless it is in very sandy soil.

The winter covering of straw, prairie hay, sorghum stalks, or whatever is used, should be put on before severe cold weather, and removed about the middle of April. If dragged between the rows and allowed to remain it forms a fine mulch, which besides keeping the fruit cleam and making a convenient path is worth fully its cost in holding moisture when the season is dry. There is so little genuine prairie hay to be obtained nowadays that it is better to avoid running any risk of hay seed, and to use straw.

The varieties of strawberries are almost numberless, and each year sees the introduction of new and superior kinds, together with many utterly worthless ones. Probably out of every score introduced half a dozen are worthy of cultivation, and really form a stride forward in the march of improvement. For hardiness, productiveness, and ability to hold its own against weeds and grass, there is no doubt but that it will be sometime before anything superior to the Crescent Seedling is found. There are many kinds, however, which in some respects, either in quality, firmness or size are its superiors, such as the Manchester, Daniel Boone, Sharpless, Jersey Queen, Piper's Seedling, Capt. Jack, Wilson and Bidwell, besides a large number of newer sorts.

What we all want now is a strawberry that to the superiorities of the Crescent will add better quality, larger size, and firmness. The man who can introduce such a berry will be a public benefactor.

We have a seedling of our own which we highly prize, but we have no hopes that it will fill this long-felt want. It is quite a curiosity, being so light in color—almost white. It was found two years ago growing in a raspberry row some twenty feet from a patch of Capt. Jacks. For two winters it has been exposed to the cold without apparent injury. It is not a staminate although the plant resembles the Crescent. The fruit is of good size and is very round-shaped, with a peculiarly pleasant wild flavor that we have never met with elsewhere. When we have fruited it the coming season in our fruit beds we can better determine its real value.

Mr. Osborn: This being the first fruit of the season, it is usually thought the best of all. But the question with us is, what are the best varieties?

Mr. Williams: The essential thing is, what is the most profitable fertilizer? The Jewel seems to lack in vigor and don't put out runners.

Prof. Witherell: I think the Bubach superior to others.

Mr. Holmes: The essayist is fortunate in finding six good varieties. I think if I get six out of fifty, I do well. The Bubach is the

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best in nearly every respect. The berry is large and of handsome color. The Jewell is not a success with me. The Jessie is not as good as the Bubach.

Mr. Willard: I raise the Crescent and fertilize with James Vick. The Jessie is a firm berry.

Mr. Rackster: I have a new berry, large, good color and firm. No name. It is the most promising berry I know.

Mr. Branson: The fertilizer of the Crescent must be a late one. Even Crescent, will generally self fertilize at first, but later the berries will be imperfect or fail without pollen of some other kind. Atlantic seems a success as a pollen variety. Kentucky by several was thought to be a good fertilizer for Crescent.

Mr. Holmes: The fertilizer should be early on one side of the row and late on the other. The Crescent in a wet season will fertilize itself.

(A paper was read on "Farmers' Flower Gardens" by Mr. W. Greene, of Davenport, but not having been furnished for publication, is omitted.—*Secretary*.

DISCUSSION.

Geo. Van Houten was called out by the president, and said; "I agree with Mr. Greene in plans and directions given, but the average farmer, if he has a taste for flowers, will not spare the time and devote the care necessary to make a flower garden; yet every home should be adorned with flowers and the many hardy shrubs and perennial plants that can now be easily obtained, make it within the means of every farmer to have a succession of flowers. Exchanges can be made with neighbors, and even if you patronize the nursery for a few of the less common plants, the cost need not be very great. I am aware that the many disappointments caused by unscrupulous dealers, selling tender or worthless plants, and recommending them to be hardy, has made people distrustful; yet plants and knowledge are at hand, so that the planter can plant with reasonable certainty of success. I will not attempt to give a list, but such plants as Honeysuckle, tree and climbing; Syringa, Spireas, the newer Lilacs, especially the dwarf, are but representatives of a class as hardy as can be desired, and many others with as light winter protection will give satisfaction. When these hardy shrubs and plants are started they are there to stay, and are a great satisfaction to the busy farmer, who

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is rushed so with work in the spring that he cannot plant a flower garden."

Mr. Osborn: I notice that many people buy a few plants every spring, but take no pains to care for them afterwards. They at least should be protected for a few days until they begin to take moisture from the ground.

Mr. Greene: The soil should be firmly pressed around the plant when transplanted.

Mr. Temple: I like the remarks of the gentleman on hardy plants and shrubs. Since we have so many plants and shrubs we have less need of bedding plants. They have long buds instead of blunt buds as the common varieties. Hyderangeas will bloom from July until frost if they are kept trimmed. Phlox, Larkspur, Perpetual Phlox, sweet scented and different colors and varieties; Hollyhocks and some of the new very fine Paeonies are very desireable. Paeonies, Dahlias, and other well known flowering roots and shrubs, with hardy roses afford a fine selection and continous blooming from spring until freezing weather.

Mr. Greene: There are only a few really hardy shrubs.

The following telegram received and read.

HAMPTON, IOWA.

To the Eastern Iowa Horticultural Society:

Your fraternal greeting just received in our meeting. We thank you for your kind wishes and hope all the blessings asked for us, may be returned to you tenfold.

NORTHERN HORTICULTURAL SOCIETY.

The President appointed the following additional committees:

Business.—Prof. Witherell and Messrs. Willard and Lucas.

Nomination of officers.—Messrs. Williams, Thomas and Branson.

Place of meeting.—Messrs. Nichols, Cotta and Van Houten.

Membership.—Messrs. Dyer and Branson.

Nomenclature.—Messrs. Mead, Cotta and Van Houten.

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WEEDS.

BY HENRY LOWE, DAVENPORT.

He who rises in meeting, to testify concerning the faith that is in him, is generally expected to say something both new and true. Not an easy task, by any means, for horticulturists as well as theologians have some difficulty in arriving at absolute truth. It seems to be a job like reducing a repetend to a decimal fraction, approximation is all that can be attained. And as to saying something new to a gathering of men to whom horticulture is a speciality, how can it be expected of the average granger, to whom it is merely a side issue, perhaps a sorely neglected one? Have we not beheld the sturdy farmer move in the direction of the garden kind of reluctantly, with a scythe on his shoulder, and was it not perfectly clear what this horticultural movement implied? He was after the subject of this paper, he was going for the weeds. Here we are on common ground, for we have all been there, fighting them, perhaps on bended knees, sweltering in the sun, prostrate in the dust. How desirable, if one had only to sow and plant, stir the soil a little and then enjoy the beautiful harvest! But Providence has willed it otherwise, and a desperate conflict has to be carried on, beginning with the awakening of vegetable life in spring until the approach of winter. Let us survey the field where our battles are to be fought.

Such part of the garden as is used for the growing of annual vegetables, and of course plowed every year, gives no chance to either perennial or biennial weeds, but favors the annual kinds: chiefly wild millet and purslane. The former may be entirely eradicated, because its growing season does not extend into autumn, but the latter is truly invincible; the better the soil the more thorough its cultivation, the better it prospers. Strange that this weed, so formidable in gardens and onion fields, should cut no figure whatever in general farming, where it hardly puts in an appearance. To fight it successfully, the ground should be frequently stirred while it is small, but this brief opportunity is often neglected; the market-gardener having so much ground to go over, and the farmer giving precedence to corn and potatoes. When it has grown to any size it utterly refuses to wilt and die when cut off or pulled out, every shower causes it to send out new roots and there is nothing left but rake together and remove it.

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The ground occupied by grape-vines and small fruit, while not exempt from either millet and purslane, has in addition a display of perrenials peculiar to itself. A small weed belonging to the cruciferae family, starts unperceived and undisturbed in the fall, and in the spring often blooms and matures seed before the tardy cultivator interferes. Then blue grass and dandelion seed will blow in, drop and grow in the center of currant or goose berry bushes and form a perfect mat there before any one is aware of it. Plantain, sorrel and grass will take possession of the strawberry patch, until there is no help for it but to dig it up and plant a new one. Plantain is likewise a troublesome weed in lawn and orchard; it can, however, be destroyed by grazing, though often found in meadows, it cannot live in a pasture. The favorite weed of a neglected orchard is the burdock, if it once gets a good hold, it is almost impossible to get rid of it. Even if cut off below the ground with a spade while in bloom it will send up another supply of sprouts; when these too are removed, sometimes even a third crop, if the fall be favorable. And these, hardly out of the ground, will bloom and mature seed very rapidly and generally unperceived.

In the same manner many a garden that has been well cared for during spring and summer, is somewhat neglected in the fall, when the growth of vegetables is so nearly complete, that a few small weeds, hardly perceptible would not seem to interfere with them. Nevertheless, these little plants devote their entire energy towards reproduction, and supply an abundant crop of purslane for succeeding years.

About as bad a weed as a man can get in his garden is the blackberry vine. A ripe blackberry is certainly a good thing, and in an evil hour a row of plants is set out. The horticultural editor says: It pays. It always pays you know perhaps not in dollars and cents, but in a sort of general satisfaction. The root are said to possess medical value. They certainly have the ability of traveling underground at a remarkable speed and appearing in the remotest corner of the quarter section. When the winter is severe the canes are killed, or else a dry summer will shrivel the berries before maturity. And when, by dint of a wet summer following a soft winter, there is a crop of berries, the birds, those feathered songsters and friends of the horticulturist, take them long before they are fit for human consumption. When a few are wanted for dessert, the picker has to dive, head foremost into the innermost recesses of the hedge. What woeful sound is that greeting the farmer as he returns from the field? It comes from the berry patch; it is the cry of woman in distress. In a state of frenzy he rushes to the rescue and with the aid of axe and pruning shears, finally succeeds in extricating the victim from the thorny trap, albeit, with disheveled hair and garments torn into shreds.

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NOT WELL KNOWN CONIFERS.

BY N. K. FLUKE, DAVENPORT.

"RETNA PLUMOSA" OR JAPAN CYPRUS.

An evergreen of very fine fernlike foliage While young, makes a compact growth, which it gradually loses, as it grows older and becomes more open. This can be obviated by an occasional shortening in of the leading branches, as they will push dormant buds into active growth when thus forced by cutting.

A specimen planted on my grounds in the spring of 1877, lost about three feet of its leader in the winter of 1882 and 1883, with this exception, has done well and is now a fine specimen.

RETNA PLUMOSA AURA.

This is of the same family and foliage, except as the name indicates "Golden." I know of nothing more handsome in tree foliage than this, with its golden tipped branches shading off into its emerald green background. Planted at the same time it has not suffered from the extremes of the weather. Both varieties are standing in bluegrass sod, in an exposed situation. Think they will do well throughout the south half of the State.

ARBOR VITÆ—"PYRAMIDLIS."

With its peculiar dense upright habit of growth, is a very striking object when seen for the first time. Its diameter at the base being about one-fifth its height. For its habit of retaining a good color through the winter and general hardiness, it should be more generally planted.

"GLOBE."

Planted at the same time. It is a compact ball or globe, four feet in diameter. It browns a good deal in winter like the American. These sports of the aborvitæ, are slow growers, need no trimming to keep them compact and symmetrical in form, *if not crowded*, and as they take up little room, should be in every collection, especially in small lawns would they be more

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In keeping with their surroundings than such large growing varieties as Norway spruce and Scotch pine.

JUNIPERUS SABINA.

A specimen of this evergreen I have had growing on my grounds for twenty-three years. It is now fifty-two feet in circumference and two feet and a half in height, a perfect circle in form, with a well-filled uniform surface, six inches higher in the center than at the circumference. It is perfectly hardy, browns a little in color in winter. I will not take up your time with its history, as Dr. Parry prepared a paper which can be seen in our Horticultural Report of 1885. I have propagated some from cuttings, which is very difficult, but they root readily from layers. Isolated as they are, they bloom but have never shown seed. No large collection of evergreens would be perfect without a specimen, for its rare oddity.

MENZIES, OR COLORADO BLUE SPRUCE.

I cannot close this paper without mentioning this, the handsomest of all the spruces, a native of our west coast, which is perfectly hardy when planted here if they are raised from seed which was grown on the east slope of the mountains. Specimens of this spruce differ so in color of foliage that they might be taken for different varieties. Those of the deepest blue are much sought after, but quite scarce. When this evergreen shall be better known, there will be little demand for Norway Spruce for ornamental purposes.

Mr. Temple: We usually do not trim our evergreens half enough.

Mr. Cotta: Many plants have no common names, and we are obliged to use the botanical names.

Resolution offered, asking the State authorities to print and distribute the proceedings of the different societies before April 15th next, in order that they may be read before spring planting.

Geo. Van Houten was called for and said: "As many of you know, I was not the publisher of our last report; yet the delay caused me more annoyance than any of you, or perhaps all of you together, as, being the secretary of the State Society, nearly all complaints have come to me. Last year our reports were not distributed until August, and the fact of a legislative session and the consequent amount of printing that causes, and at that time largely increased by the Brown impeachment, was given as a cause of delay. But this year, without any of those things to delay, the reports were not distributed until August. I must say in justice to myself that I was not the publisher of the last report. The past secretary, Col. Brackett, published and sent out the report, but I do not believe the delay

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was through any fault of his. I had the report of the Western Iowa Society ready at time of State meeting, and Col. Brackett informed me that he sent in copy for whole report without any unnecessary delay; yet there was a great delay in getting out the work. If we could have the money paid for the work, we could get it done very much earlier on contract of our own. As it is, the report cannot be used by the planters until the following year, when those entitled to it should have it for a guide for their spring planting."

Mr. Mead: We want the reports earlier, and then can have them fresh, and they will benefit us a great deal more.

On motion of Prof. Witherell a committee was appointed on publication of report. The President appointed Prof. Witherell and W. Greene as said committee. Later in the session the committee reported strong resolutions and the Society will present them to the State Horticultural Society at the annual meeting, to be held in Des Moines, January 17–20.

Mr. Rackster gave an object lesson on trimming grapes. He said that the great over-production of grapes in recent years convinced him that people know how to grow them, and the thing needed now was to find better methods of handling and cheaper transportation. After express charges, commissions, cost of baskets and cost of picking and handling are counted out, little if anything is left. Said 650,000 pounds of grapes were sent by express alone this year from Davenport and more than 160,000 pounds from Rock Island. The markets everywhere were overstocked, and some shipments but little more than paid express charges. He then read several bills showing the net income to the grower to be less than one-half cent per pound. Thought that if growers would combine and ship by freight they could do better.

Mr. Williams: In some parts of New York they are replacing the Concord with the Worden, and I think this is the correct plan. But the skin is very tender on this variety. They burst sooner than on the Concord.

Mr. Cotta: The Worden is sweeter and more productive than the Concord. I wish to speak a good word for the Niagara. In a dry season this variety does well. The clusters are large and delicious—no cracked fruit—and equal to California varieties.

Mr. Williams: The Niagara, Prentice and Delaware have done well the past two or three seasons.

Mr. Willard: I endorse all that has been said about the Worden,

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but it cracks open very easily. The Moore's Early is earlier than the Worden, and would be very valuable if it was as productive. The Telegraph and Early Victor are very productive, but the bunches are small. They are as early as the Worden. The Pocklington is the most profitable white grape with me. The Lady is tender. The Brighton is good.

The President appointed as committee on awarding premiums, Messrs. Dickenson, Higley and Greene.

WEDNESDAY EVENING.

BIRDS.

BY HERBERT OSBORN.

While my topic does not limit me to the discussion of birds in any particular relation I shall make my notes bear particularly upon the economic features of the bird question and more particularly on their relation to the the horticulturist as consumers of insects or fruit.

The relations of insects to each other and to the crops of the horticulturist and farmer has been a fruitful sourse of discussion and one from which unfortunately sentiment and prejudice have not been excluded. The orchardist or farmer who sees his crops rapidly disappearing before the onslaughts of greedy birds, does not hesitate to condeman them and wage bloody warfare on the feathered tribe, sometimes with little regard to the kinds of birds destroyed or their food habits. The lover of the birds, on the other hand, (and this class cannot but include also many who at times would fain destroy them), observing that his favorites are many of them insectivorous, clamors loudly for their protection, and often makes no distinction if the insects be beneficial instead of injurious. Moreover, isolated observations on the food that birds pick up at certain times can afford no accurate basis for determining the quality of their food in general and may lead to uncertain if not strictly erroneous conclusions.

The fact that birds feed upon insects does not by any means imply that they must be beneficial to man, for they may feed as readily on insects that are directly beneficial to man as on those that are injurious. For many insects it is so difficult to determine as to their true relation to the horticulturist that even knowing the insects devoured we cannot say with certainty

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as to the value of the bird in devouring them. Again, with the seed eating birds there must be a discrimination between those that feed on valuable seeds and those that feed for the most part on the seeds of noxious weeds.

The subject is indeed one of utmost complexity and it can only be after much careful work on the food eaten by certain birds and on the food of the insects which they may devour as well, that anything like positive statements can be made. Even then the relation of any particular bird will vary so much in different localities or according to the crop cultivated or for different seasons of the year, that it is doubtful if an invariable recommendation could be made. It would probably be the greatest folly to attempt to exterminate any of our native species no matter how destructive they may seem at times, since they may serve to keep in check some nuisance that otherwise might be much more serious than the presence of the bird can possi-can be, or which could not be so easily regulated as the numbers of the bird.

The laborious researches of Prof. Forbes, of Illinois, and Prof. King, of Wisconsin, have given us a very good basis for conclusions upon some of the species of birds and I purpose here to mention a few of our more common birds, giving in brief their relation so far as understood. It will of course be impossible in a brief paper to even state the evidence upon which the conclusions are based.

THE ROBIN (*Turdus Migratorius*).—This, one of our most common birds, reaches us among the first in the spring and stays with us through the season until late in fall. Indeed, it has been known to winter in the States even north of the central line, its staying probably depending entirely on whether it can secure a food supply and not in the cold of winter. Taking the season through, the evidence is very strong that the bulk of its food consists of destructive insects, and it may be reckoned one of the most valuable allies of the farmer and gardener and for most of the year the fruit-grower. Its attacks upon cherries, berries, etc., however, are sometimes so extensive that it in a short time destroys a large part of the crop it has helped to save!

While, therefore, the fruit-grower's neighbors may have been very greatly benefitted by the presence of the robins he may himself lose far more than he has gained. Probably the farmer and gardener will not see this plain enough to pay for the fruit the robin has eaten, but in such case I believe it to be entirely in the right direction for the fruit-grower to make war upon the robins, driving them from his premises if he can and slaughtering them by the wholesale if necessary. There is no danger of exterminating the species, and plenty will survive to attend to the insects. I would not, however, recommend destroying their nests and eggs for the food collected for the young is largely made up of insects of an injurious nature. If they can be driven away or killed without the use of fire arms, however, there will be a gain in not frightening away useful birds that may not be injuring the fruit.

THE CAT-BIRD (*Mimus Carolinensis*). This bird arrives later and leaves sooner than the robin and on the whole is probably less serviceable, though

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it feeds to a considerable extent on injurious insects When attacking fruit, however, the cultivator need not feel very great sorrow in disposing of them. While the ordinary note is anything but agreeable it occasionally indulges in music that rivals that of the brown thrush.

THE BROWN THRUSH (*Harporhynchus Rufus*) —One of the most familiar birds in the garden and dooryard and highly prized on account of its delightful song. In general its food habits render it very serviceable, but like the preceding species it exacts a return in the way of choice fruits in their season. Possibly we can afford to allow it a little more than the robin on account of the music it furnishes. We often pay high sums to hear rare musicians belonging to the higher biped division of animal life and we can certainly afford something to have choice music poured forth at our very doors.

THE BLUE BIRD (*Sialia Sialis*).—Almost the first bird to reach us from its southern haunts and from first to last largely insectivorous in habit. Its food consists largely of grasshoppers and other destructive species and it is, it would seem, most worthy of encouragement. It readily accepts houses put up for it to breed in and as it is much safer from enemies in such situations it will be wise to furnish such retreats for it to breed in

THE BLACK-CAPPED CHICKADEE (*Parus Articapilus*).—I have often had these sprightly little birds keeping close watch when I was chopping wood, sometimes almost within reach of my hand, ready at any moment to dart in and pick up the grubs or borers or whatever other insects might be dislodged from the wood or bark. They are said to be constant in their attacks on insects and to feed extensively on insect eggs deposited on trees, so that their value can probably not easily be overestimated. They have been credited with eating caterpillars, beetles, cankerworms, plant lice, etc. They show a tendency to become as familiar as the little house wren and should be encouraged as much as possible in this tendency. They remain with us during the winter, and at that time may do their greatest service in destroying the eggs of injurious insects. They may feed also on seeds, but as these are almost if not entirely the seeds of pine trees, or of plants that have no value from their seed products, this need not be taken into account against them.

THE HOUSE WREN (*Troglodytes Domesticus*).—The wrens are too well known to need any comment here. It would probably be difficult to find any one to raise a word against them. They are strictly insectivorous, and while no doubt often taking insects that are of service to man, their usefulness cannot be doubted. They may be greatly encourged in breeding around houses, where they will do the best of service, by furnishing them with places in which to nest. No expensive house is needed, an old fruit can or rough box being duly appreciated by their simple tastes.

Of the SWALLOWS, the wren swallow and the eve swallow are perhaps the most common. Their food, taken largely on the wing, consists almost entirely of the adult forms of insects, and the records so far made indicate that the majority of these are injurious. The birds ought therefore to be given all the encouragement possible Their nests should not be disturbed,

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and on the contrary provision should be made for their occupany of their favorite places about the barn.

THE PURPLE MARTIN (*Progne Subis*), also belonging to the swallow family, cannot make as good a showing for itself. Though a very general favorite and encouraged by the erection of numerous houses for its accommodation, examinations of its food have shown a considerable proportion of honey bees and the adults of useful insects. It also, however, feeds extensively as some records show upon injurious insects, and it will not do as yet, I think, to condemn it. Further careful study of its food should be made.

Of the large group of birds knows as sparrows it is impossible to speak in detail. They are largely seed eating birds, but many of them devour vast quantities of the seeds of noxious plants and thereby render a direct service to the farmer, while many feed in part on injurious insects. It must be admitted, however, that many of the weeds are kept under by the ordinary methods of cultivation, so that the birds need not be given too much credit. Many of them are social, agreeable little visitors, however, and until they are found to feed destructively upon valuable crops they should be allowed the freedom of yards, gardens and meadows, where they abound.

This brings us, however, to a bird of foreign extraction, which has forced itself upon the attention of the American public and has received thorough study. It is gradually extending its borders and will doubtless in time infest every city and hamlet in the country. It is already, I think, established in all the larger towns of the State and many of the smaller towns. Swarms of them may be seen now in Ames, and I have been informed by one of the residents that the first pair came in but three years ago, while at present they have driven all other birds away. The Division of Ornithology of the U. S. Department of Agriculture having taken up the study of its distribution and habits, a vast amount of evidence has accumulated regarding it. With this evidence for reference it seems safe to assert that it can be only a pest in our midst and should receive immediate and thorough treatment.

It is not only a serious nuisance about houses and in the parks of cities, but indirectly assists the multiplication of noxious insects by driving away birds that naturally feed upon them. It is destructive in the orchard and garden, feeding upon apples, grapes, pears, plums, cherries, currants, lettuce, peas, beets, etc., and carries on most extensive depredations upon wheat, oats, rye, barley, corn, etc., wasting more than it consumes.

After careful discussion, of which the above is but the briefest outline, Dr. Merriam makes the following decisive recommendations:

RECOMMENDATIONS FOR LEGISLATION.

The following recommendations are respectfully submitted to the legislative bodies of the various States and Territories.

(1) The immediate repeal of all existing laws which afford protection to the English Sparrow.

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(2) The enactment of laws legalizing the killing of the English Sparrow at all seasons of the year, and the destruction of its nests, eggs, and young.

(3) The enactment of laws making it a misdemeanor, punishable by fine or imprisonment, or both—(*a*) to intentionally give food or shelter to the English Sparrow, except with a view to its ultimate destruction; (*b*) to introduce or aid in introducing it into new localities; (*c*) to interfere with persons, means, or appliances engaged in, or designed for, its destruction or the destruction of its nests, eggs, or young.

(4) The enactment of laws protecting the Great Northern Shrike or Butcher Bird, the Sparrow Hawk, and the Screech Owl, which species feed largely on the English Sparrow.

(5) The enactment of laws providing for the appointment of at least one person holding civil office, preferably the game constable, where such officer exists, in each town or village, who shall serve without additional compensation, and whose duty it shall be to destroy or bring about the destruction of English Sparrows in the streets and parks and other places where the use of fire-arms is not permitted. In the larger towns and cities this office might be well imposed upon the commissioners of public parks.

It is not expedient to offer bounties for the destruction of Sparrows. In fact, at the present time it is desirable, and perfectly feasible, to bring about a great reduction in their ranks by concerted action of the people, aided by helpful legislation, without drawing upon the public purse.

RECOMMENDATIONS TO THE PEOPLE.

The English Sparrow is a curse of such virulence that it ought to be systematically attacked and destroyed before it becomes necessary to deplete the public treasury for the purpose, as has been done in other countries. By concerted action, and by taking advantage of its gregarious habits, much good may be accomplished with little or no expenditure of money.

The Sparrow is a cunning, wary bird, and soon learns to avoid the means devised by man for its destruction. Hence much sagacity must be displayed in the warfare against it. In the winter-time, if food is placed in some convenient spot at the same hour each day for a week, the Sparrows will gather in dense flocks to feed, and large numbers may be killed at one time by firing upon them with small shot. Sometimes they may be successfully netted or trapped, but this requires considerable skill. They may be poisoned by grain soaked in tincture of nux vomica or in Fowler's solution of arsenic, but poisoning is attended with some danger, and should be attempted only by official sparrow-killers.

Large numbers may be destroyed and increase prevented by the systematic destruction of their nests, eggs, and young. By the aid of an iron rod and hook, set in the end of a long pole, most of their nets can be reached and brought down. This method promises most satisfactory results.

They may be easily driven from their roosting-places by disturbing them on several successive nights. A very efficacious method is to throw water

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upon them when at roost. In cities where hose-pipe is available the process is simple and certain. They may be kept out of ornamental vines in the same manner, particularly in the breeding season, when a thorough soaking not only disconcerts the old birds and kills their young, but at the same time does much good by wetting the vines and washing out their filth.

THE SPARROW AS AN ARTICLE OF FOOD.

In this connection it should not be forgotten that the English Sparrow is an excellent article of food, equaling many of the smaller game birds. In fact, at restaurants it is commonly sold under the nama of "Rice-bird," even at times of the year when there are no Rice-birds in the country.

Prof. J. A. Lintner, State Entomologist of New York, informs me that English Sparrows are now sold largely in the market at Albany, N. Y., "one dealer reporting a monthly sale of about 2,000."

Aside from the species enumerated above there are a considerable number of others which affect the horticulturist in one way or another, but we shall have to defer their consideration.

REPORT OF DIRECTORS.

After another year's experience we find we have made but little progress in horticulture.

With a year of unprecedented drouth making sad havoc upon our trees and plants generally.

The strawberry to begin with. A fair crop was harvested, selling from 8 cents to 12 cents per quart. Crescent leading, while some others that were in a high state of cultivation did quite well.

Raspberries bid fair for an abundant crop, but in consequence of the dryness of the weather dried upon the bushes. Gregg, Souhegan, Shaffer's, Cuthbert and Turner being the principle varieties. Shaffer's seems to be growing in favor rapidly with those most acquainted with it. Plant largely of it.

Next we notice the blackberry, which shared the same fate as the raspberries, but very few found their way into our market and they much reduced in size. Wild ones a total failure. Snyder was the only variety reported worthy of cultivation.

Grapes an abundant crop, and of fine flavor. The Concord leads, of course, for very good reason as did the Ben Davis years ago, and (*may again*,) because there are so many more planted in comparison. Worden, where planted, yelding equally well, and finding a more ready market at double the price. In my opinion, those who plant the latter will have no cause to regret it. Martha, Pocklington, Niagara and Empire state all deserve a place in the

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vineyard. I think we find in the Niagara, flavor *equal* to any grown in California.

We now pass to the *cherry*. Light crop and trees going out rapidly. We are sadly in need of something that will wear better. Early Richmond and English Morello are the principle varieties. The latter with me has proved itself a much better bearer than the former. Much has been said in favor of Montmorency Ordinaire; of this I know but little personally.

Plums can not give a favorable report, owing largely to the effects of the severe drouth, the older varieties producing sparingly, De Soto and Forest Garden doing much better; the former on our grounds did remarkable well, showing but little effects of curculio. We have in our county a seedling that is attracting much attention. The original tree has been fruiting for the past eight years, producing a *heavy* crop each year. Fruit of good size and excellent quality, *very* sweet and juicy skin, not leathery or tough like many others, color yellow, free stone. Tree rather a feeble grower, but having every appearane of being hardy and adopted to our rich prairie soil, as it originated there. Are in hopes we have in this variety a great acquisition for the amateur.

As to the apple, the fruit of all fruits. One year ago we were in a horticultural fog, and to-day finds us about in the same condition, hoping that in the near future we may *see clearly*. The trees have been so pinched by the drouth that it would be hard to tell what the condition would have been had it been otherwise. The varieties left us are as follows: Duchess, Wealthy, Willow Twig, G. Golden, Hass, Romanstem, Rams, Sweet, Tollman's Sweet, Perry, Russet, Golden Russet, Whitney No. 20, Tetofsky, and last but not least, Black Annette. Some of these show some signs of decay. Many yielding quite bountifully. And in regard to Black Annette we have reports from parties who have been fruiting it from six to sixteen years (Cedar county) with a clear record, having good annual crops with no appearance of decay in tree. The fruit of excellent quality, and a late keeper which seems to supply a long felt want. I find it to be a good nursery tree, rather good form and habit. One director giving his experience with Ben Davis says he has some that are bearing abundently and seems healthy, but what I was going to say, select a bearing tree with good body and hardy and top-work Ben Davis, being careful not insert the grafts too near the body or in too large limbs. He says he knows of trees managed in this way that are hardy and bearing heavy crops. We are not ready to abandon the old Ben Davis.

A. COOPER,
Chairman Board of Directors.

Committee on nomination of officers reported as follows, Mr. Osborn declining to serve longer as president:

President—A. G. Williams, Chester Center.
Vice-President—W. B. Gregg, West Liberty.
Treasurer—Henry Strohm, Iowa City.

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Secretary—C. W. Burton, Cedar Rapids.

Directors—A. Cooper, Coal Creek; A. Branson, West Branch; A. G. Williams, Chester Center; N. K. Fluke, Davenport; Geo. Bomgardner, Cedar Rapids.

The above report was adopted.

REVISION OF FRUIT LIST.

Summer Apples—Sweet June, Whitney No. 20, Duchess and Tetofsky. Also Taylor and Yellow Transparent for trial.

Fall Apples—Wealthy, Fameuse, Haas, Longfield, Hawthorndon. Also Wolf River and Ramsdall's Sweet for trial.

Winter Apples—Tallman's Sweet, Willow Twig, Grimes' Golden, Roman Stem and Black Annette.

Plums—De Soto, Forest Garden, Wolf, Miner. Also Maquoketa for trial.

Cherry—Early Richmond and Wragg.

Strawberry—Crescent, Kentucky, Charles Downing, Capt. Jack. For trial, Piper's Seedling, Jessie and Bubach No. 5.

Raspberry—Souhegan, Gregg, Turner, Tyler, Shaffer's Colossal.

Grape—Concord, Moore's Early, Worden and Pocklington.

Currant—Victoria and Fay's Prolific.

Blackberry—Snyder. For trial, Lucretia Dewberry and Stone's Hardy.

THURSDAY MORNING.

THE CULTIVATION OF THE MUSHROOM.

BY THOS. GRANVILLE, DAVENPORT.

In the cultivation of all other vegetables we see something tangible to start with; seeds, plants, or roots, but here we may almost say we see neither, for the seeds cannot be seen with the naked eye, and it requires an unusual effort of the imagination to believe the white mouldy substance we call spawn to be either plant or roots. There are many different systems of growing the mushroom; in this I will only detail one method, which I have practiced for many years with unfailing success. To make the cultivation of the mushroom profitable, it must be done in a building either specially erected for the purpose, or in some shed, stable or cellar, where a temperature from 45° to 65° can be sustained during winter, will

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suit. The time of beginning may be any time during winter; I usually begin preparation about the 1st of October, which bring my beds into bearing January. My method of growing the mushroom is very simple, and can be accomplished to a certainty by any one conforming to the following directions: Let fresh horse droppings be procured from the stable; add about the same weight in fresh loam from a pasture or sod land, or soil of any kind in fact, that has not been manured, the danger of old manured soil being that it may contain spurious fungi; let the droppings and soil be mixed together as the droppings can be procured; if they can be had all at once in quantity enough, so much the better; let the heap be turned every day so that it is not allowed to heat violently until you have got quantity enough to form the bed of the dimensions required. Be careful that your heap is under cover so that it cannot possibly get wet. Now, from the prepared heap of droppings and soil, spread over the bed a thin layer; pound this firmly down with a brick; then another layer; pound down as before, and so on, until it reaches the depth of 10 inches. The most convenient size for a bed is from four to five feet in width. Be careful that the bed be no more nor less than ten inches; more would cause the mass to heat too violently, while less is hardly enough. Into this bed plunge a thermomter. In a day or two the bed will heat so that it will run up to 100° or over, and as soon as it declines to 95° or 90°, take a dibble or a sharp stick and make holes all over the bed at the distance of about twelve inches each way to about half the depth of the bed. Into each hole put a piece of spawn of the size of a hen's egg or so, covering up the hole again with the compost, so that it will present the same level, firm surface as before the spawn was put in. Let it remain in this condition for about ten or twelve days, by which time the spawn will have run through the whole bed. Now spread evenly over the surface of the bed nearly two inches of fresh loam; firm it down moderately with the back of a spade and cover up the bed with three or four inches of hay or straw. This completes the whole operation of planting the crop. Nothing now remains to be done but attention to the proper degrees of heat and moisture. If you can control the means of heating so that the place can be kept uniformly at a temperature of 65°, all the better, but if not, it may range from 50° to 60°. It should never get much below 50°, else the bed will become cold too quickly and delay the crop until too late in the season to be profitable. Unless the air of the house has been unusually dry the mushrooms will appear before any water is required, but examination should be made, and if the surface of the bed appears dry a gentle sprinkling of water, heated to about 100° must be given; with this treatment beginning in October, our first crop is ready for us in January, and as the musrooms do not come up all at once, it takes about three weeks to gather the crop. After this a slight dressing of fresh soil of about half an inch in depth is spread over the bed again; beat down with the spade; this gently watered with tepid water when dry, and a second crop of mushrooms often better than the first.

Although spawn is procurable in all horticultural stores, yet as to such as desire to make their own spawn, I give the following brief directions: Take

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equal portions of horse droppings, cow dung and fresh loam, mix the whole thoroughly together as you would make mortar, then form it into cakes about the size of a large brick, place them on edge under cover until they become half dry, then insert into each a piece of spawn half an inch or so square; let the bricks remain until they are quite dry, then spread about eight inches of horse dung over the floor of the shed on which build the bricks in a pile three feet wide by three feet high, keeping the side in which the spawn has been put uppermost, then cover them over with sufficient stable manure so as to give a gentle heat through the whole, and in two or three weeks the spawn will have spread itself through the whole mass of each brick; they are then removed to a dry place, and will retain their vital properties for many years.

Mr. Granville: This is the most powerful food known. One pound is equal to 5 lbs. of oysters. The way to distinguish the poisonous from the wholesome is to eat them; if they kill they are poisonous. They are cooked as oysters are cooked. Often the wild ones come up in the fungus bed. The good are pink and turn black after being picked. The poisonous ones are of a dirty brown color.

Prof. Witherell: I never eat puff balls.

Mr. Granville: If the mushroom is red it is safely eaten.

THE USES OF HORTICULTURE.

BY W. H. HOLMES, DAVENPORT.

Mr. President:—I ask your attention for fifteen minutes to my topic, the uses of horticulture; not expecting in that time to exhaust the subject or do it full justice, I will attempt no details, for I have none to communicate, but will remind you of some of the least obvious uses of our favorite pursuit which, if small in themselves, in combination are useful to the individual and to the Society.

In the United States, in the early part of the present century the range of horticulture was comparatively restricted, except near large cities and even there rather limited.

The vegetables in ordinary gardens were few in kind, and, with the exception of seedlings, fruits were confined to a few varieties requiring little care. In extent, the vegetables, fruits and flowers rarely went beyond the ability of wife and children in the family "to dress and to keep." In my boyhood, not seventy-five years ago, the now common tomato, raised by

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thousands of bushels in every State, and in cans exported to many foreign lands, was then a mere curiosity, being but the small, smooth, oval, brilliant-red fruit of a vine raised in flower beds along side lilies, roses, pinks and hollyhocks, for show alone, and when gathered, placed on the mantel shelf as ornaments, with dried everlasting flowers, Job's tears, pomegranates and Jerusalem gourds.

Progress being the great law of the universe; time wrought many changes in dietetic tastes, which use soon converted into wants—if not needs—for a greater variety of food; especially more vegetables and fruits than were attainable by our early ancestors while struggling to banish forests, subdue prairies, and build homes which were generally surrounded with animal life, wild or tame, and which could readily be supplied with grain and the common vegetables. Industry and economy brought prosperity and allowed time for consideration in the direction of increasd comfort, including knowledge of the nature, uses and results of food beyond mere sustenance; thus leading to a wider range of production, and use of more mixed diet, and so laid a firm foundation for horticulture.

This improvement in food, while less stimulating to the physical man, by furnishing cooler and purer blood, promoted to greater strength and influence the humanizing and refining faculties and qualities, thus gradually educating the appetite for finer food.

Our population was steadily enlarged by immigration from older lands, and these immigrants naturally sought their favorite vegetables and fruit; and demand as naturally stimulated improvements and multiplied varieties until choice of what we shall eat is almost embarrassing.

Thus in course of time either by choice, from knowledge, or through necessity born from experience; there were enough persons educated to require a liberal portion of appetizing vegetables and luscious fruits, to make for them a ready market.

Under this stimulus domestic gardens became insufficient; and our ideas of propriety released our wives and daughters from the task of supplying family vegetables and fruit.

To supply the increased want, enterprising persons established market gardens near large cities, farmers enlarged their orchards, vineyards were planted, and fruits in large variety found place in private or professional grounds, until by production or importation, all climes and all lands furnish their surplus of whatever will bear transportation in natural condition, or in any shape made possible by many forms of preservation.

Your speaker largely accepts the theory—if it be theory—that we measurably develop special traits in accordance with our diet and occupation. If this view is correct, it alone would accord to horticulture high rank among the elevating and refining pursuits of life.

Its entire life brings man close to nature in its most attractive forms, being a grand union of beauty and use in constant succession. It enables him to feel that his living is earned, or his leisure employed, in work which has no degrading tendency; for the result neither damages health, perverts the intellect, or depreciates the morals of either producer or user; but di-

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rectly and indirectly tend to a refine, to elevate and ennoble all participants, by promoting health, sound digestion and sleep, pure conduct, and a helpful life.

To those engaged in such pursuits, lessons of use and beauty are numerous; and, as was said of yore, "they may read who runs."

Horticulture gives broad scope for the intellectual as well as moral faculties.

It requires close observation of individual objects; their size, number, color, weight, order and extension, or growth.

It requires attention to many and varied conditions; to relations of soil, climate and weather; to fertilization, tillage and protection, and to the commercial disposal of harvested crops.

Nor is mental activity limited to the observing faculties. The reasoning powers will find ample scope in so adapting means to ends as to profit by observation, and through experience acquire wisdom.

Besides this general education of the intellect, the horticulturist, if true to himself and others, will find full opportunity to acquire and illustrate the great virtues of industry, attention, perseverence, patience under disappointment—sure to occur—a sublime admiration for and faith in the adaptive and constructive forces of nature, and unfaltering trust in the future, in a broad sense, when for a time even the elements appear to conspire against him, and despite his most strenuous efforts compel a record of failure.

It has been my fortune to attend as a spectator several horticultural meetings in other States, and I could not fail to note the superior exhibition of intelligence, harmony and courtesy, as compared with meetings of bodies devoted to selfish interests depending on legislative or some special privilege or favor. I think the difference is largely accounted for by the fact that in our gatherings, no purely selfish end being encouraged, there is no ground for cunning or distrust, and benefits, as they should be, are reciprocal.

This general fact, showing a high tone in business, is one of the proofs of the broadening and elevating results of the pursuit of horticulture, where encouragement is given to rivalry without petty jealousy and to success without envy; for whoever can announce a valuable fact, a well supported theory, or the discovery of a new plant, fruit or method, is accorded patient and courteous hearing.

The claim is sometimes made that floriculture ranks higher than horticulture, but this cannot be substantiated. Certainly I would not underrate the value of the first named as a refining and expanding agency through admiration for a cultivation of such forms of grace, the hues and odors of which afford gratification to sight and smell. I rejoice in the mutiplicity of these messengers of beauty, and hail with satisfaction the cheapness which brings flowers of many varieties within the reach of any day laborer, but we must not in our admiration for flowers forget the fact that in addition to beauty and exquisite odor, fruit as food is able to sustain all the activi-

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ties of life, including the highest use of all the faculties which enable us to appreciate the charm of flowers.

One great, visible distinction between savage and civilized life is the fact that in barbarism, some of which still clings to our civilization, ornament precedes and is rated above comfort or utility. Until the lesser can include the greater the reverse of this is the true philosophy. While the exquisite beauty and odor of flowers is shared by fruit, to the latter is added another source of delight, the wide realm of the sense of taste or flavor.

The delicate tinting of apples, pears, peaches, cherries and many other fruits, the royal purple of many berries and grapes, the pink, crimson, or scarlet of raspberries and strawberries, and the various rich hues of many kinds of common vegetables are scarcely, if at all, less attractive than the flowers whose mission is to briefly bloom and perish without any substantial contribution to the great flower and fruit of this planet, the human system.

I have been told by many persons, themselves owners of conservatories and admirers of flowers, and who have traveled through California, that no collection of flowers they had ever seen, equaled in beauty and fragrance the magnificent orchards, counting up to thousands of trees, and to hundreds of acres in area; of peaches, pears, apricots, oranges, cherries, plums, figs and other fruits in bloom, often filling the air with fragrance before they were even visible.

In view of all the facts here cited, showing a rare and extensive combination of beauty and use in the product of horticulture over mere beauty or mere utility, to it unquestionably belongs and should be conceded, the prize for the highest merit.

In concluding a subject which has been sketched but not exhausted, in view of all the beneficial results of an honorable calling, which only abuse can degrade to low aims, or to groveling thoughts, we shall profit by the lessons of horticulture, and all other elevating instruction, until, in the great garden of humanity, we become as flowers of beauty and fruits of use, giving as we receive, freely diffusing our mental products and moral graces, so that, by our firesides, among our associates and in our public walk, we will be an honor to our occupation, and a living monument of its uses and value; while our own souls can rest content in the reflection that we have done what we could, and are only waiting until, like ripe fruit which is dissolved into the higher human life, we pass onward and upward, educated and purified for the broader life and nobler uses of the summer land.

DISCUSSION.

Mr. Strohm: I endorse this paper fully, especially what is said about the moral tendency of the business.

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WINTER PROTECTION.

BY A. G. WILLIAMS, CHESTER CENTER.

The remark has frequently been made in our horticultural gatherings that we occupy the battle ground where the two forces, heat and cold, have their fiercest conflicts. We have heat enough and season of sufficient length to grow the finer fruits, but the intense cold of our winters puts the larger part of our fruits in the list as not quite hardy. The rule is almost universal that to improve the quality of any of our fruits, is accomplished only at the expense of the hardiness of the plant, and when raised up to a degree of excellence above their primitive type, they, like our improved domestic animals, require especial care to get the best results.

Many of our fruits in consequence of their natural habit of growth can not be protected by an artificial covering, and the best we can do is to furnish such surroundings and culture as will best prepare them for the cold of winter.

With the orchard, when young; good culture, with the ground not overly rich; with crops of corn, potatoes or beans, with good wind breaks, is about as favorable a condition as can well be maintained, but when it has attained some age crops of buckwheat, or a late crop of millet, and farther on clover with the removal of the wind-breaks is about all that can be done to modify the influence of our winters.

Several years ago one of our leading horticulturists recommended the planting of evergreens on the south side of tender trees. Those who followed the suggestion do not report any especial benefit, but several instances have come to my notice which go to show that the close proximity of evergreens tends to make the tree more hardy.

With our small fruits much more may be accomplished; many kinds too tender to stand without covering, may be profitably grown by furnishing the proper covering. The points to be gained are:

First—A greater variety, including those of higher quality.

Second—A greater certainty of a crop.

Third—A larger crop of more perfect fruit.

Fourth—Better vigor and growth of plant, and in many cases the crop ripens earlier.

We have not a blackberry or a raspberry on our list so hardy but what it will be greatly benefitted by covering. While it is true that to cover the whole cane of the raspberry and blackberry, and all of the wood of the grape

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a greater degree of vigor may be preserve, yet with our hardier kinds the object sought is mainly accomplished by covering such of the buds as we desire for fruiting. It is more practical, and the work is more easily and rapidly done than most growers are aware of, and its practice is on the increase. The principle difficulty is to get the canes down to the ground without cracking or breaking them off. Nearly if not all of the red raspberries or those that sprout from the root are bent down without difficulty. The Snyder blackberry and the Cap raspberry are the more difficult to handle, but with first year's planting, and with patches old enough to have a surplus of canes a sufficient number may be selected that will bend to the ground without breaking where they can be held with crotched pegs, which, with a pair of pruning shears can be made very rapidly at a convenient brush pile. The removing of a little earth from the side of the blackberry lessons very much the liability to break off. The Kittatinny blackberry is much more easy to lay down than the Snyder, and Wilson's Junior is still better; the plant is more productive, and the fruit is larger and better in quality.

Leaves are nature's material for mulching, and I think there is nothing better, and when they fall is the time to mulch. In most cases leaves cannot be used, and earth is the most practical thing to use. If the plant is quite tender, it should first be covered with earth, and then with some kind of mulch. Aside from covering, good clean culture is essential to prepare the plant for winter.

After pegging down the canes it may sometimes be practical to use the plow, but usually the spade is to be preferred, as with the plow the earth is taken from too near the plants, and the liability to disturb the roots may be too great, and more earth than is necessary or desirable is thrown into the row; besides, more canes will be broken in the operation, especially when lifting them out in the spring.

The practice of covering grapes is becoming almost universal among our market growers, and far north the covering of blackberries and other small fruits that could not be grown without, is becoming more common.

It is hardly necessary to mention the strawberry, as it is well understood that it should be protected. I would only add that where coarse material, such as wild hay, potato tops, corn stalks, or similar material is used, the work may be done as early as the last of October, with better results than to wait until the ground is frozen, as is more commonly recommended.

DISCUSSION.

Mr. Fluke: Would you cover the whole blackberry?

Mr. Williams: It is only necessary to cover the buds.

Mr. Osborn: What protection is necessary to keep the mice away?

Mr. Branson: I advise putting arsenic and cornmeal in tiling.

Mr. Williams: There is some unsafety in the use of poisons; some would mix oatmeal and plaster.

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Mr. Van Houten: Some plant corn near by to supply the hunger of mice; this is especially good for rabbits.

Mr. Clemens: I advise keeping the grounds clear of weeds and grass.

Mr. Bomgardner: I use fish oil.

Mr. Gregg: I used tar and oil and lost half of my trees; oil alone might have done.

Mr. Branson: Axle grease smeared on the bark will keep off the vermin.

THE MANGEL WURTZEL.

BY JAS. DYER, PLEASANT VALLEY.

After an experience of over eighteen years with various kinds of roots for feeding purposes, I have found nothing that will come up to the Mangel Wurtzel for economy and profit; they outyield any other root crops I have ever tried to raise. I have raised fifty-six tons to the acre, and this season, although extremely dry, the yield I got was thirty tons or one thousand bushels, costing a little over three and one-third cents per bushel.

My method of planting is to plow the ground in the fall; any stubble ground will do; corn ground would be as good, only the expense of getting off the corn roots; then in the spring, as soon as I finish sowing oats, I prepare the ground by sowing about one and a half to two barrels of salt per acre; then harrow thoroughly, and mark off in rows three feet apart; I next make ridges by throwing two furrows together, using the marks as a guide to go by.

As soon as the young plants are above ground I take a wheel hoe and go along each side of the rows as close to the plants as I can. In a very short time I can go with a horse and cultivator. When the plants are as large as small cabbage plants, or in the fourth leaf, I thin out from 10 to 15 inches apart. The remainder of the work is done with the horse and cultivator, going through them from four to six time as may be required.

I gather them before the first hard frost. Topping is the first thing to be done. Take hold of all the leaves, withered and green, in both hands and giving a twist they will break off easy. We then pull them, commencing on the third and fourth rows, pulling them and letting them drop. Then take the first and second rows; pull them, throwing them on the first rows pulled; then the fifth and sixth rows. Thus you get six rows together,

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ready for the wagon. By leaving them pulled for an hour or two the earth drops off and you can put them into the pit or cellar free from earth and and away from all frost.

CANNING FRUIT.

BY MRS. O. W. DICKINSON.

In choosing this subject I am aware it is not new and one that does not require a lengthy article, but while so much care and money are expended in ascertaining and cultivating the best varieties of fruit it seems but proper to find some way of preserving them beyond their alloted time.

Comparatively little was known in our grandmothers' time of keeping perishable fruits for winter use, except occasionally to dry or preserve them by cooking in sugar.

At the present time every provident housewife expects to have her larder well supplied with all kinds of fruit, prepared in a variety of ways and ready at a moment's notice for the table, and far from its being an expensive luxury, it is economy regarding its medicinal qualities alone.

The process of canning is of quite recent date. Some improvements have been made in the methods as also in the can used. Tin should never be used for any kind of fruit, as it greatly injures the flavor and color, to say nothing of its poisonous properties.

The Mason jar is, I think, the best and the one which I always use.

Next to having a good can the fruit should always be fresh, of the best varieties, and in the best possible condition, care being taken to discard all over-ripe or mashed berries.

It is a mistake that anything is good enough for canning. The best is none too good when fresh, much less after it has been kept for a length of time.

I have tried a variety of ways, such as cooking, with and without sugar, and by standing the jars filled with fruit in cold water, and then placing over the fire till the fruit was thoroughly cooked. Success in any case depends upon excluding the air.

The length of time required in cooking depends upon the kind of fruit, as some kinds contain more air than others. Thus, strawberries, apples, tomatoes and grapes are among those hardest to keep, or which contain most air, while cherries, plums and peaches are among the easiest. The acid peculiar to the last named also helping to keep them.

I always cook my fruit until the bubles of air cease to raise, and skim often.

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The method which I prefer, and which I find is quite new to most of my lady friends, and one which I use for raspberries especially, is canning with sugar and *without heat*. I take the fruit as soon as possible after picking, look it over carefully and put it in an earthen dish (a common milk crock answers the purpose) with an equal quantity, either by weight or measure, of granulated sugar, and with a wooden masher mash together till no whole berries or parts of berries remain, or until it is perfectly smooth and even. Then after letting it stand for half an hour to let the air bubbles come to the surface I fill the jars as full as I can and put the cover on and tighten as in case of cooking, then put the jars away in a cool dark place. I have tried this method for ten years with red raspberries, and have never lost a can, while they have retained their flavor, and have seemed as nice and fresh as when put in the cans.

This year I tried black raspberries in this way for the first time, and found tnat they kept equally well.

Strawberries are more difficult to keep, but can be kept with proper care. The fruit must be perfectly fresh, ripe, hard and firm. Where the pulp is quite soft they are more liable to ferment. After the cans have stood for a short time they freqently separate. The solid portion rising to the top and leaving the syrup at the bottom. This shows a lack of sugar or the presence of gas from the air bubbles which have been left in. In such cases I remove the cover and pour the contents of the jar into an earthen dish, and with a spoon stir it thoroughly, and after letting it stand a short time, with a spoon take off any bubbles from the top and put the fruit back in the can and put it away as before. I frequently have to do this, but never lost a can or had one ferment to spoil. I have often opened a can in the early part of winter, and after using a part, let the remainder stand till spring, and it has remained unchanged. It is not a more expensive way, for when it usually takes two quart boxes of berries to fill a quart can put up the usual way without sugar, this way one box of berries, with an equal measure of sugar, will fill the can. You can readily see from the comparative prices of the two it is no more expensive. I think the season has a great deal to do with the success of keeping fruit, the past two being the best for ten years. I cannot tell the reason for this unless it be that the fruit has ripened without much moisture, and is in better condition, being sweeter and richer.

MANAGEMENT OF FOREST TREES.

BY C. F. GARDNER.

The wholesale destruction of forests in the United States long ago attracted the attention of the older states, and measures have been taken to counteract the evil. It has been estimated that even in New York, timber

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has been destroyed at the rate of 150,000 acres per year, most of the wood going for railroad fuel and building. Land owners are growing more careful and the young trees once grubbed out as worthless trash, are now very generally not only spared, but nursed. The ordinary process with natural growth is to exclude browsing cattle, and thin out, taking the crooked and damaged first, and next such as will make hoop poles, fence stakes, etc. The timber left will grow more rapidly and will be more handsome and valuable than a full natural growth. With care, the growing trees may be grouped in lines, and ample wagon roads be left for easy communication. Raising trees from seed takes more time and care, but will furnish better timber and larger profits. In planting a forest I believe in putting the trees close together at first, say four feet apart each way. Rare and choice varieties should be planted from twenty to sixty feet apart each way, and the space between filled in with trees of lesser value, to be cut away as occasion may require. Care must be taken that the trees do not crowd each other too much. If such is the case they will be unshapely and spindling in growth. Much has been written about pruning forest trees, with a view especially to the production of taller, straighter stems. A considerable difference of opinion exists as to the extent to which this pruning should be practiced. It is, however, very generally delayed till the branches to be removed have attained too great a size, and it is then very rudely performed, to the spoiling of the timber rather than to the improvement of it. The practice of leaving snags, instead of cutting branches clean off, has particularly bad effects. Plantations far more frequently suffer from being thinned too little than from being thinned too much. The thinning of a plantation which has been allowed to grow too thick, must, however, be very gradually performed, that it may be beneficial, and not injurious. After a sudden thinning, a plantation sometimes ceases to thrive, and many trees are often laid prostrate by the next storm. When the trees begin to crowd each other cut out those that should be removed, although they may not be good for anything but the brush pile.

I think that the best time for thinning, in this climate, is March or April, although it may be done earlier in the season. Great care must be exercised, that deciduous trees do not encroach upon the evergreens. The best rule that I know of is this: Keep your plantation so thinned that the branches of the trees will almost touch, but never overlap each other. I have no special advice to give as regards cotton wood and lombardy poplar plantations, except this: Cut them down as soon as possible and plant a new grove with trees that will be of some benefit to your fellow man. Do not try to start a new plantation among old cotton wood trees or lombardy poplars, willows or any other kind of soft-wooded, fast-growing trees; it will be a waste of time and money if you do. Cut them down, or what is better, grub them out and start new. Instead of the above mentioned trees, plant birch, ash, butternut, Black walnut, cherry, oak, maple, spruce, pine, fir, Red cedar, and many other varieties, which are of some value when grown. In this country, to secure the best results, the ground should be prepared the same as for corn, and after the trees are planted they should

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be kept free from grass and weeds, by such cultivation as will keep the ground as level as possible. The cultivation should be continued until the trees shade the ground so much that weeds and grass cannot grow. On land subject to prairie fires, a strip two or three rods wide, or more, should be kept under the plow, around the whole plantation; such crops may be grown as arrive at maturity early, so that the ground can be plowed in the autumn before prairie fires run. Too little attention has hitherto been generally paid to the adaptation of the kinds of trees that are planted, to the soil and climate; and to this cause many failures are to be ascribed. While the catalpa will succeed in Southern Iowa, with us as a timber tree it is a complete failure. Some trees grow well even in exposed situations, among which I may mention oak, birch, Scotch pine, larch, and Red cedar. They are fitted to form either entire plantations, or to occupy the outer part, and so shelter other trees that are less hardy, which are not planted until the outer zone or belt of the most hardy kinds, is somewhat advanced. Some trees suffer from an amount of moisture, from which others would derive benefit; but in general, the thorough drainage of the land intended for a plantation is one of the circumstances most important to its success. To the necessity of this thorough drainage we must look as compensating, or more than compensating, the influence which woods exercise in condensing the moisture of the atmosphere, and in rendering a climate cold and damp; marshy soils being in this respect still worse. The shelter of plantations judiciously disposed, whether in belts or otherwise, is also of great importance in rendering them suitable for that improved agriculture in which thorough drainage is of the first necessity, and which is always productive of amelioration of climate.

THURSDAY AFTERNOON.

The members of the Society visited the Academy of Natural Science, after which they were treated to a ride by the local horticultural society to different places of interest in and around Davenport, Rock Island and Moline.

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THURSDAY EVENING.

WINDOW GARDENING.

BY W. OTTO GRONEN, DAVENPORT.

When last fall I was surprised by a letter from your Secretary, containing an invitation to read before your Society at its annual meeting in this city, a paper on "Window Gardening," I really, in that surprise was unable to think of any thing that I could possibly say, that had not been said many a time before, but it so happened that the above invitation reached me at a time (the forepart of October) when in almost every household's front yard the busy house-wife was energetically engaged with carving knife in securing her pet plants for the winter, and some how or other in passing them in my daily walks to and from my office, I paid a little more than casual attention to the doings of these busy workers, and it did not take very long for me to come to the conclusion, that after all, threadbare as the subject of window gardening has been talked, there was still plenty of opportunities to say something on the subject to good effect.

Do you remember when for the first time your attention had been drawn to the miraculous beauty of plant life and its development through leaves, buds and flowers? If you do, you may also probably remember how almost suddenly, as with an iron grip, you were fully taken up with this new impression, and how you made the most ambitious plans for the furtherance of this new hobby; how you begged for a cutting of every new plant you met with, to take it home, root it and enjoy the prospective plant. If you remember all this, you will also remember how you supplied yourselves with the best kinds of flower pots that were obtainable, and in the generous and liberal disposition of the moments, you selected them "good and large," so that your young plants would have plenty to feed upon.

When fall came, and with it the time to prepare these plants for the winter garden, you potted them, and after the pots were all filled, you met with your first perplexity; there were already more pots to be housed than you had made preparation for in your windows, and besides there were still

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a good many "choice plants" left unpotted that could not possibly be thrown away. What you actually did in the emergency with these, to save them, I could hardly tell and will leave it for you to finish the picture. What you did after your plants were potted you also probably know better than I could tell you, but if you did as I saw last fall on my morning and evening explorations, most people do, you huddled them all closely together in some corner of your piazza or porch, if possible fronting the north or northwest, so as to shield these floral gems from the pernicious rays of the sun and give them the full benefit of a free circulation of a northern zeyhyr. In this "congenial" corner you then left them; protecting them against the skirmishers of Jack Frost with a newspaper, a kitchen apron or an old shawl, thrown over them at night, until at last, happy moment! they were finally placed on the hard-earned window shelves in your sitting room where a good rousing fire, by day and night, in some measure recompensated them for the "hardening process" in that pious corner of the porch.

But thanks to your "large-pot" theory the plants had plenty of room and breathing space about them, and having now everything that love and devotion could possibly supply them with, they ought to have gone on to grow and bloom lively. But Alas!—they didn't. Those plants didn't grow a bit, although you kept the room "nice and warm" and gave them plenty of water every morning.

If, however, on the other hand, through some kind friend you had been told before hand not to use too large pots, but the smaller the better, and in potting your plants you finally succeeded in finding a suitable pot for every one of the many varieties of plants you had accumulated; your joy was immeasurable when you finally had all these floral gems satisfactorily grouped closely on your window shelves so as to form one dense mass of healthy and gorgeous foliage, with perhaps here and there a flower peeping through. Didn't your floricultural enthusiasm run high then, and weren't you glad you did not do so stupid a thing as to buy such big and ugly flower pots as your neighbor Mrs. so and so did?

After a little while, however, some of your plants began to exhibit here and there a few yellow leaves, which as time passed on grew more and more, and at the end of a couple of months or so, it was evident that something was wrong with those plants. Asking some one of your friends who enjoyed your confidence in horticultural matters, you were told that no plants could possibly thrive in such a closely packed mass, and after a more careful examination of the plants the suspicion became a fact, that all these plants were thoroughly infected with Red spider, thrips and several other entomological celebrities. In short, this proved to be your first disappointment, or rather your first valuable lesson in window-gardening, and I strongly suspect that you have continued these primary lessons in floriculture for several seasons after; finding the next season that something else was wrong—perhaps your soil was not just what others told you it ought to be and so on.

Now this is just about the condition of things. And let me tell you this same method that I have just illustrated is not only followed in a few indi-

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vidual cases, but in a very large measure by many that love plants and make strong and persistent efforts to cultivate a number of them, for the purpose of decorating a few windows in their home during winter.

I know full well that there are many intelligent amateur florists around us, thinking men and women, that have a keen faculty for observation, which in most cases leads them to do the right thing at the right time, and who always have their windows filled with healthy, well to do and well shaped flowering plants, and such a person is really entitled to great credit —even the honorary title of "gardener." But on the other hand, there were very many, and they make up by far the majority, that don't seem to get at the secret that makes the sure success in growing plants in the window. And for the benefit of these, and perhaps those that intend to embark in the future in the pleasures of window-gardening, and in order to bring at the same time my small tribute to the furtherance of such an important object as floriculture represents, from an educational and moral standpoint, it may not seem out of place to recapitulate in a very brief and general way some of the main points that are essential in order to be successful in these attempts. *The first thing to think of is the soil.* "A suitable soil is" as Peter Henderson repeatedly says in his valuable publications "in the flower garden of the first importance to sucess." And easy and simple as it is to obtain such soil, there is hardly an instance, that I could recall to memory, where a suitable compost had been prepared for the potting of house plants.

A few sods laid in a pile with alternate layers of rotten stable manure, the whole kept moist by pouring over it from time to time some dish, or wash water and covered up with a few old boards to protect it some from the heavy rains is all that is needed. This pile, turned over every few weeks to aid fermentation with an admixtures of about one-fifth or one-sixth of sharp river sand will give you a very excellent soil for almost any plant to grow in. The addition of a quantity of leaf mould will greatly improve this compost; but in choosing this mould it is necessary that the leaves be completely decomposed, and very desireable to obtain it from the decayed leaves of trees of a sacharinous character, or at least trees that are not classed with such trees as the Oak, Hickory or other nut bearing trees; as I have found in my experience, that the tannic preperties of a leaf mould, obtained from the decayed leaves and refuse of the latter, is besides other defects, very much more disposed to what is commonly called sour.

In using siol for potting be sure not to have it too moist—not to say sticky —nor too dry or pulverized, or even sifted through a very close riddle, and if it is to be sifted at all, let the meshes of sieve be not less than ¼ or ½ inch wide.

Now that our compost pile has been properly taken care of in the early spring, or still better in the previous fall, let us leave it to its slow fermentation and turn our attention to the next subject of importance, which is the plants themselves.

In my estimation the proper time for winter gardening begins in the early spring. Do not leave it till September to get your plants ready for winter bloom, but as soon in spring as you got through with the first rush of

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garden operations and all your vegetables and flowers properly started and planted out—say about June—get some good healty cuttings of the varities of plants you wish to grow in your window, place them in a flat box with clean river sand and cover up with a pane of glass in a partial shady situation. Here the cuttings of most plants such as geraniums, fuchsias, heliotropes, etc., will at that time of the year root in a very few days. Do not leave them too long in this sand bed, but as soon as they are rooted, which will be in ten or twelve days, pot them off into two inch pots. When the plants have filled these pots with roots, shift them into three inch pots, and finally in to fours. Keep the plants moderately moist by repeatedly showering overhead and prevent their blooming and growing out of shape by pinching off any buds that might appear and also any shoot that is disposed to outgrow the rest, and thus impair the symmetry of the plants. If large plants are wanted another shift into a five inch, or even a six inch pot, will be necessary by about the first of September, or a little before. But when the window space is limited, a four inch pot ought to be sufficiently large for any ordinary plant to thrive in, and at the same time give a profusion of bloom.

I would not advise to follow the habit of lifting the old plants that have been at work in the open, blooming profusely all summer. As a general thing these plants are overgrown and shapeless, and need a good rest after their seasons growth is over, and especially to overcome the disturbance occasioned by digging up and replanting in a pot. Young healthy vigorous plants are the only ones to rely on for success; I mean, if you want flowers instead of leaves in winter. If you have not the facilities of raising such plants yourselves, try to obtain them from some of your local florists, who generally, after the spring season for the sale of bedding plants is over, have a good selection of just such young plants, as you require for that special purpose, on hand. Not only that, but at the same time have all the advantages of a large and complete collection of the best old and new varieties of the various plants to select from, and all this for a trifle of an outlay in money. By all means do not start out with sickly plants, they never will be a success, no matter how you watch and pet and nurse them. And let me remark right here that you make out a list of plants you wish to grow, and their number for which you have convenient space in your windows. It is a very grave but universal mistake to have too many plants, more than you have room for. Among the many different varieties, choose such as will adapt themselves best to the unnatural conditions under which they will have to fight for their existence in our common living rooms, where there is generally too much heat and dust, and a corresponding deficiency of air and light.

The next subject of importance is the preparation for their removal into the house previous to the setting in of winter weather.

As soon as the plants are shifted into the pots that they are intended to grow in during the winter, a good idea is to plunge them into an airy situation into the open ground, sheltering them if possible against very heavy rains, using the usual precaution of placing a few handfuls of coal ashes

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under the pot to prevent earth worms from getting into them. Shower them daily overhead during the hot season, but still keeping them as a general thing only moderately moist, in order to keep them stocky and prevent their growing rank.

At the first indication of frost, lift the pots and place them somewhere on the south side of the house, or a similarly well-sheltered position, giving them all the sunlight possible. As the season advances, but some time before it becomes necessary that fires are required to make your living-rooms comfortable, bring your plants in, giving each its respective place in the window, and give them all the advantage of fresh air on warm days by lowering more or less the upper sash, according to the character of the weather. Continue to shower them several times during the week, in the morning, especially on clear days. As the weather changes to colder, this giving air to the plants will require some discrimination, and will have to be at last discontinued altogether. From this time on nothing more will be required than to supply them properly with moisture and keeping them clean and healthy by occasional showering, and the removal of decayed leaves and withered flowers.

So many people ask me the question, "How often do you water your plants?" expecting some definite formula as to time. It is evident that such a formula cannot be given. A plant needs watering when it is dry, and not sooner; and there is more harm done by the wrong application of water to plants than by any other abuse. It is by far less injurious to let a plant go dry, so as to have its foliage slightly wither, than by over-watering it.

A temperature from 68°-70° at daytime (which, by the way, is the best temperature for man) and at night from 50° to 55°, is the best suited for a healthy development of plants and blossoms. Let this temperature be as even and constant as it can practically be done, for sudden changes are no more appreciated by tender plants than they are by delicate babies.

THE ORIGIN AND DEVELOPMENT OF FRUIT IN THE PREHISTORIC AGES.

BY PROF. L. R. WITHERELL, DAVENPORT.

The soils of no two spots on earth are composed of the same chemical combinations. No two spots are subject to the same climatic influences. The soils range from the granite fragments near the mountain tops to the rich alluvial of the drained lake bed. The climates vary from the burning sands of the great Sahara Desert, with its fiery winds, to the frigid plains

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of Siberia, with continents of ice for a sub-soil and with a degree of cold at times equal to 100° below zero.

No two living animals have always a uniform taste for the same food, and no two plants, even if it were desirable, could ever succeed in securing just exactly the same plant food in exactly the same ratio of supply. Hence no two plants can ever be exactly alike, no two fruits with exactly the same flavor, no two berries exactly the same size. Any plants, fruits or vegetables, and, for that matter, animals as well, of any variety are only approximately alike. A perfect *fac simile* is unknown to Nature's God.

Here then is the key that will unlock the unknown past. Here is the philosopher's stone. Here is the primal fact in Nature that gives us infinity, that gives us the countless blessings of life, "the eternal law of variation." Without it the world would be a barren waste; a chaos of granite rock surrouuded by a waveless ocean, with it there are millions of desirable forms, millions of living creatures, each happy in the enjoyment of individual existence.

Every pulse throb of every living, beating heart echos a prayer of thanks to nature for the blessing of life. Every flower that blushes, from the kiss of the sunlight, waves its thanks of perfume as payment for the blessings which it enjoys.

Every wavelet of light that carries sensation to any living eye is a blessing to the creature possessing the organ of sight. Every effort of nature to satisfy any natural craving of any living thing is a step toward a higher form, and while the steps have been numbered by countless millions in the past, they are only in the beginning so far as this earth is concerned.

Then let us try and understand the past in order that we may be better able to assist nature in the developments of the future.

Life is one eternal struggle for food. The embryo plant that sends out its tender leaflets and tiny rootlets is only extending its baby arms beseechingly for food. If it finds an abundance of food in easy reach it grows to be a perfect plant. If the supply is meagre it is hopelessly dwarfed. If little or no food is found it will wither and die. So, too, with the infant animal. Its every effort is to secure food, and if the right food is not at hand it will vainly try to seek nutrition from any object within its reach.

The more nutritious the food is the more intelligent will the animal or insect be in its sphere of life. The wild races of men who eat fruit are kindlier disposed than the flesh eating savages and cannibals. The civilized races who eat largely of fruits and vegetables are less warlike and more progressive than those who are more addicted to meat eating.

It is one of the best known facts of nature that wherever moisture falls upon a barren waste, plant life will spring into existence.

The sand burr will cover up a sand hill in a few years with a coating of dark soil that will sustain other less hardy plants, and eventually the sand hill or sandy plain will become a fertile field.

The tiny creeping vines will cling to the barren waste of rocks or lava beds, and in time the obsidian slope will blush with a thousand lovely flowers and enrich the world with its varied forms of vegetable life. Insect and

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animal life will follow, and if the food is not adapted to the insect, the insect will adapt itself to the food.

Some of the earliest forms of life like the little annelids made hearty meals during their entire lives, from the solid limestones. Rather dry eating, you will say, but they like it better than they would roast turkey and cranberry sauce.

An insect has lately been discovered in Germany with a taste for iron and steel, and they threaten the future of our railroads by actually eating into the rails as the wood worm will destroy your best ax handle. Ships and houses are destroyed and eaten up by worms and ants.

The nasty, bitter walnut hull is the very choicest morsel of food for one type of larvæ.

Every kind of vegetable matter is subject to the attack of some form of life that destroys it to procure food.

Is it any wonder, with all living creatures trying to eat something every hour of their lives for countless thousands of years, that every form of fruit and plant and flower have been tried again and again by the varied forms of life in their endless struggle for food.

Every bird that ever pecked and carried away a berry or seed of any tiny plant has aided in the development of our grains and fruits.

Every porcupine that ever rolled in a thicket of plums or crab apples and carried away the fruit on his spiny back, was doing something for generations of animals and men of later years.

Every chattering monkey that ever climbed a tree and carried away in his pouched cheeks a fruit or nut was doing some to make the world better.

Every bee or butterfly that ever unconsciously flitted from flower to flower, in search of hidden nectar was surely doing something in the way of cross fertilization.

Every freshet that ever washed a nut or fruit or seed or bulb from a barren hillside, to a rich warm valley below, was aiding in the great work of development, in the pre-historic ages.

By these natural transfers of seed whereby every plant has been tried on every kind of soil, and under all conditions of climate, the gradual early changes took place, but it is only since man's intelligence began to sort out and use the very best varieties that great progress has been made. I have seen a wild crab apple in Mercer county, Illinois, that bore fruit from two to three inches in diameter. Man has now stepped in and taken that crab apple and several of us have trees growing from its cuttings, and we hope to produce, by cross fertilization, a hardy, good, well flavored apple. The latter part of the work is being vigorously pushed by our most worthy neighbor, Mr. N. K. Fluke.

In my boyhood days I found a wild plum tree in Knox county, Illinois, that bore fruit that would average as large as hen's eggs. Had I known then what I do now we would now have a plum larger and better than I have ever seen.

A few years ago there was a plum tree in northern Iowa that bore double plums. This was not the case with a few, but with almost the entire

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crop. This tree is an example of those fruits that become double, then quadruple, etc., until a cluster is formed. The strawberry, raspberry, mulberry, blackberry, etc., are examples of perfected clusters, the original having been but little round berries as large as bird shot. This tendency to grow double is seen in almost every form of life, both vegetable and animal, but in only a few does it appear to be of enough advantage to induce nature to perpetuate it.

The rose, and in fact most flowers, have been greatly improved by florists by taking advantage of this tendency in nature.

Most of our common fruit, such as apples, pears, plums, peaches, blackberries, raspberries, strawberries, etc., belong to the order Rosaceæ, or rose plant, and by the way some of the most valuable types have never been developed so as to be desirable for food. The common wild rose would develop into a splendid fruit for the garden. The ordinary thorn tree along the river banks would make a delicious apple. The peach in all its countless variety was developed from the rind of a nasty little bitter almond.

It is possible to develop the hull of a walnut, hickory nut, pecan or even the bitter pig-hickory nut, into varieties of fruit.

Thousands of bitter, sour, and even poisonous berries, from the woods might be developed into fruits of the most delicate flavor.

The order Solanaceæ, or the deadly nightshade type of plants, has given us not only the potato and the tomato, ground cherry and egg plant. Why, friends, you can take the great egg plants, tomatoes and ground cherries, and in a few years dwarf them to their original types, as small as the little black poison berries that grow on the ordinary nightshades; or you can develop the potato ball into a lucious tomato.

One of the locust trees belonging to the order Leguminosæ has developed the pod into the famous St. John's Bread; another, the Honey locust, could easily be worked into a fruit. The luscious pine apple is only a developed pine cone, a great big pulpy blossom. The gooseberry is developed from an ugly little thorny burr, about as juicy as a sand burr.

Our common fruits are only developed ovules or seed pods, and there is reason to believe that even the leaves, stalks and roots of plants may be developed into vegetables of almost fruit-like qualities.

To show the tendency of plants to change and modify let me refer to the family Brassica, where the blossom is developed into the cauliflower, the leaves into the cabbage, the stalk into the kohl rabi, and the root into the rutabaga. So you can readily see that in the future, as in the past, plants can be modified into millions of unheard of forms, to shower untold blessings upon the future generations of mankind.

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THE RELATION OF POULTRY TO HORTICULTURE.

BY DR. F. M'CLELLAND.

The only and the best thing I know about poultry is—fried chicken! And the best and about the only thing I know about horticulture is—that garden sauce and berries touch the vacuum in the average citizen's spring-time commissary apparatus, with kindly and satisfactory results not experienced in any other diet.

And all I know about the relation of poultry to horticulture is, that chicken gravy and sweet potatoes, roast turkey and cranberry sauce form about as amicable relations between an empty stomach and palatable pabulum as any combinations known to the culinary art.

My knowledge of the industries under consideration being thus limited, the task of showing any other relations between horticulture and poultry is a difficult one. And the more I contemplate it the more am I amazed that the incubators of topics for discussion at this meeting, should have hatched out these incongruous topics and then called upon me to blend them into one subject.

But, gentlemen, if you expect me to make a harmonious combination of this incompatible material, I am compelled to say at the beginning that you have made either a mis-deal in the topics, or a mistake in the one selected to discuss them.

As separate industries, both horticulture and poultry have their pleasures and their profits. Take poultry raising, for instance. We very much question if the first baby creates more interest or brings more pleasure to the household than the first early chicken. And what more interesting sight is there than an old hen scratching for her brood? provided she is not scratching in the garden! And what poultry raiser has not contemplated with supreme delight a flock of bronze turkeys on dress parade? providing they are not parading through the strawberry bed! And what man or woman is so lost to a realizing sense of cunning and the ridiculous as not to be interested in watching a brood of baby turkeys catching flies.

The industries of poultry raising and horticulture are very interesting in the abstract, but when you attempt to combine them, they both lose their attractions, and trouble begins.

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The fact is, both observation and experience have convinced me that the relation of poultry to horticulture is destructively antagonistic. It is about the same which exists between cats and mice, chickens and skunks or incompatible temperaments in the connubial relation. We don't believe a cat will watch a mouse with more destructive intent than a flock of poultry will watch a garden with the same intent. Nor that a skunk will do more harm in a hennery than will an old hen and her brood in a garden. Nor that there will be more discomfort, trials and tribulations; more throwing of stovewood, pot-lifters, flat-irons and rolling-pins, and more loud talk and cuss words in the household of the incompatible wife and her incompatible husband, than there will be in the household of those misguided persons who attempt to combine poultry raising and horticulture on the same quarter section.

Domestic fowls, I believe, are considered omnivorous. I infer this from the fact that city editors of poultry journals, and curbstone agriculturists and poultry raisers advise a mixed diet for poultry; and are explicit in their directions for feeding laying hens; that their diet should consist largely of meat, mush, milk and bread, parched corn, cabbage, carrots and curious dietic combinations generally. We don't know whether these theoretical poultry raisers know a Shanghai from a bantam; nor whether they can tell when an egg savors of sulphurated hydrogen if it be spoiled, or is the choice product of some new and superior breed, but strongly suspect that they don't; but I do know that, be the opinion of these theoretical advisers as to the poultry business true or not true from the naturalist's standpoint, or be poultry omnivorous, herbivorons, graminivorous or any other kind of nivorous by nature, it is decidedly and empathically gardenivorous during garden time.

And more than this, all who have attempted to combine these industries will find that, as the gardening season advances, their poultry is omnipresent, at least so far as the area devoted to horticulture is concerned. And, still further, that the cunning and sagacity exhibited by poultry in discovering and appropriating the choicest vegetables and the first ripe berries, proves most conclusively that poultry is omnicient, at least so far as the garden is concerned.

But I do not wish you to infer from this assignment of attributes that I have any thought of deifying poultry; on the contrary, when I contemplate its relation to horticulture, I would relegate it to the other extreme of orthodoxy. And I believe I would echo the sentiment of every man or woman who has tried to establish and maintain amicable and profitable relations between poultry and horticulture were I to say: To hades with the whole tribe, high bred and low bred.

But however antagonistic we may view the relation between poultry and horticulture, there is a peculiar affinity between poultry and a well cultivated garden which it seems almost cruel to disturb. Your chickens seem to engage in the business of dusting themselves in your garden with as much gusto and delight as do your boys in bathing in forbidden waters; and they seem to take as much enjoyment in scratching among your vegetables as the

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average young American does in digging angle worms on your nicest lawn, while visions of chubs, suckers and bullheads flit through his fertile brain. Who has not contemplated with pleasure an old hen, who, having scratched a hole in your nicest garden bed as big as a buffalo wallow, peacefully reclines there with eyes closed, wings spread out, feet extended and feathers opened, drinking in sunshine and solid comfort at every pore, with a placidity of countenance, an abandonment of all care and concern about sublunary affairs which drew forth your warmest sympathies, elicited your highest admiration and inspired a wish that you could be as happy as she? And who has not felt a pang of remorse on driving her away, and felt that the pleasure she was enjoying more than compensated for the damage she was doing.

There seems to be something in the soil of the garden for which poultry has a peculiar liking and an irresistible desire to appropriate to its own use.

You may provide for your chickens the finest dust baths, place them in convenient and attractive localities; dig up rods of ground near the hennery and make the most perfect and attractive arrangements for dusting and scratching and they will never notice, much less appropriate them. But as soon as the garden is made they will travel any distance, fly over the highest picket fences, creep through undiscovered holes and scratch their feathers off crawling between barbed wires to reach it. And on reaching it they at once proceed to dust themselves in your most carefully prepared beds and to scratch in the places where they can do the most harm.

Speaking of scratching reminds me to say that the time-honored adage that "an old hen will scratch as hard and as long and as much for one chick as she will for a dozen," isn't correct. I refer to this for the reason that in these days of supposed correct information on all important subjects, the subject of poultry scratching should be explicit and correct. How do I know that the old adage is a delusion? I know it from actual observation and sad experience. And this is how I found it out: I once had an old Plymouth Rock hen, which was a good setter; so good that I imposed upon her good nature by making her hatch out three broods in succession. When the last brood was hatched I took compassion on her and let her keep them. And she was such a placid, kind, industrious, motherly old biddy that I concluded she would make a good stepmother; so I kept adding to her family until she had one hundred and fifty. And it would have done the average poultry raiser's soul good to see "old Mother Cragin," as we called her, spread herself in trying to gather into her maternal embrace all those chickens! But those she couldn't hover hovered her, and it was hard to tell when they got nicely settled down in the hovering business which was hen or which was chickens; and Mother Cragin was often hid from view by that part of her family which couldn't get under her wings. And to see Mother Cragin scratch for that family! The fact is, it wasn't scratching, it was literally harrowing; and her success was as pronounced as that of the latest improved revolving harrow. She did more scratching than forty hens with a dozen chickens each would have done. We couldn't get a coop big enough to keep her and her family in; so we let her have her own way, permitted her

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to roam at her own sweet will. The result was that the family supply of vegetables that summer came from the green grocer's. The Mother Cragin experiment convinced me of the falsity of the adage quoted, and I have not permitted myself to suffer from the delusion since. It also convinced me that the legend of the hen scratching a ditch so broad and so deep about an ancient city, as to save it from invasion is true. I regret exceedingly, however, that the historian does not tell what breed that hen was nor how many chickens she had.

With this digression I return to the subject under discussion to say that there is no diet, theoretical poultry raisers to the contrary notwithstanding, which has so much attraction for poultry as fresh, crisp vegetables. But the trouble is they are not satisfied unless they can pick them from the native beds. You may stuff your poultry on vegetables and fruit you select for them yourselves and feed it at their regular meals until they turn away from it in apparent disgust; but just as soon as you turn your back upon them they mrke a bee line for the garden where they devastate the strawberry bed, eat more lettuce, radish tops, peas and cabbage in fifteen minutes than they would eat in twenty-four hours if you picked and fed these articles in the regular way.

But we are told by theoretical horticulturists and men who raise poultry by proxy, that poultry saves the garden from destruction by bugs, slugs and worms. It would be a difficult matter to make the average denizen of the rural districts who has watched the bug and worm destroying theories, tumble to this kind of a racket.

These poultry raisers and horticulturists by proxy gain their knowledge of the business by seeing the poultry about the yard and the vegetables on the table; and having heard that bugs and slugs and worms destroy vegetables, and that poultry destroy these pests, and knowing that the women folks raise both poultry and vegetables, they conclude that the presence of the former is necessary to success in the latter. But they are ignorant of the dozen times a day the women folks have to drop their work in the kitchen to "shoo" the chickens out of the garden, and that the price of the vegetables they eat is eternal vigilance on the part of their wives and daughters.

Now, with all due deference to the poultry, bug, slug and worm eating theory, I venture the opinion that no poultry, high bred or low bred, mixed or mongrel, will hanker after bugs, slugs or worms as long as there is any garden truck for them to feed upon. And we will venture a further opinion that the average chicken, hen or rooster, turkey hen or gobbler, duck or drake, goose or gander, will pick shy of every cabbage worm, striped bug, slug, Colorado beetle, or cut worm in the garden, while they eat every vegetable the bugs and worms have skipped, and regale themselves upon everything but bugs and worms. I have yet to see a chicken, old or young, tackle a striped bug, show any anarchal tendencies toward the potato bug, any disposition to annihilate the cabbage worm or to exhibit any industrious tendencies toward deep scratching for cut worms. They may do these things after they have picked all the leaves off the melon and squash vines, scratched

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out and picked all the potatoes, devoured all the cabbage and eaten all the corn, but I have never suffered my experiments in this direction to go that far; hence I am unable to say what poultry might do after it had eaten all the vegetables and was forced to a diet of worms. My experience with Mother Cragin and her family convineed me that it would be as wise to turn an old sow and her pigs into your garden, with bug exterminating expectations, as a hen and her brood.

But there is another view of the relation of poultry to horticulture which is worthy of attention; namely, as it relates to the peace and harmony of neighbors. The neighbors who respectively raise poultry and cultivate gardens on contiguous lots are not neighbors, much less friends, after the first season's experience. Neighbor women can borrow and never return; can send each others children home with "a bug in their ears," or even the marks of a shingle at the base of their spinal columns, and social relations still continue; neighboring men may fall out about politics, religion, a dog fight or the repairing of a partition fence and the breach be healed and amicable relations again established; but when one neighbor's chickens destroys another neighbor's garden, or to prevent the destruction one neighbor kills another neighbor's chickens, the solution of neighborly continuity is never repaired; the hatred is rock rooted, men nor women "speak not as they pass;" the children are forbidden to hail each other across the fence, much less to swap gum, and all neighborly and friendly relations are severed for time and eternity.

Hence if I ever originate a real estate boom I will make it a part of the contract of every lot I sell, that the purchaser shall never engage in either the business of horticultnre or poultry raising.

The industries of horticulture and poultry date very far back in the world's history. Adam and Eve, you know, were gardeners. You are all familiar with the disastrous failure they made of it. The subject is a delicate one, and I will not dwell upon it. I refer to it, not to stir up any unpleasant reflections among modern horticulturists, but simply to note how ancient the industry is, and as a warning to all horticulturis not to bank too heavily on the profits until the crop is gathered, lest like Adam they find when too late they have eaten all the profits and are bankrupt in purse and character.

Elijah, I believe, was the first man who succeeded in the poultry business. He got a living from it—which is more than can be said of the average poultry man of modern times.

But later on in the history of the world, trouble began between poultry and horticulture, and their antagonistic relations were fully established, and plainly set forth.

We are told, in the parable of the sower, that "some seed fell by the wayside, and the fowls picked it up." So, you see that in the days of the Apostles, poultry had the same thieving propensities it has to-day.

And since, from the mention of the fact, that the fowls picked up this seed, I infer that the sower was also in the poultry business, and I very much regret that we are not told how he managed to prevent the seed which

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fell upon good ground and brought forth so abundantly, from being scratched out.

That amicable and profitable relations between poultry and horticulture might be established I am willing to admit—provided they be kept several miles apart.

And if I were solicited for my opinion as to how far apart would be a safe distance, I would say that five miles between the garden and the larger breeds of poultry, and ten between it and the leghorns, dunghills and turkeys would be far enough to give reasonable assurances of safety.

But in the words of the Psalmist: "Hear now the conclusion of the whole matter:"—Select either of these industries and stick to it; but don't monkey with both if you desire peace of mind, serenity of temper and length of days.

The Committee on Place of Meeting reported that Cedar Rapids be our next place of meeting, December 5 and 6, 1888.

On motion report adopted.

TREASURER'S REPORT.

H. STROHM, *in account with Eastern Iowa Horticultural Society:*

DEBIT.

Dec. 6, 1887.	To cash on hand	$ 35.88
	To C. H. Filkins, membership	1.00
	To membership, fees from Secretary	6.00
	To membership fees—meeting at Davenport	33.00
Total		$ 75.88

CREDIT.

Dec. 8, 1887.	By amount paid Secretary for printing program	$ 2.25
	By postage on programs, reports, etc	2.70
	By paper	.25
	By N. K. Fluke, telegraphing	.35
	By printing at Davenport	1.25
	By premiums paid on apples, etc	5.30
	By balance on hand	63.78
Total		$ 75.88

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PROGRAM FOR MEETING IN DECEMBER, 1888.

Strawberries—W. H. Holmes, Davenport.
Blackberries—J. K. Bloom, Lisbon.
Something that fruit-growers should do—Prof. L. R. Witherell, Davenport.
Grape culture for profit and home use—W. O. Willard, Grinnell.
Orchard culture—C. P. Osborn, Fairfax.
Influence of stock on scion—N. K. Fluke, Davenport.
Market gardening—E. H. Smith, Dubuque.
Experiments with the Russians—O. A. Kenyon, McGregor, and R. P. Speer, Cedar Falls.
Horticulture and home making—H. W. Lathrop, Iowa City.
What trees to plant—C. G. Patten, Charles City.
Propagating and growing Evergreens—D. A. Porterfield, Traer.
Subject to be given—O. W. Dickenson, Grinnell.
Packing and storing fruits—I. V. McCagg, Davenport.
Subject to be chosen—Prof. J. L. Budd, Ames, and Prof. S. N. Fellows, Waterloo.

NAMES OF MEMBERS.

L. R. Witherell.....Davenport.
O. P. Nichols.....Davenport.
I. V. McCagg.....Davenport.
N. K. Fluke.....Davenport.
Wm. Greene.....Davenport.
Edward Roberts.....Davenport.
E. Mead.....Davenport.
Wm. H. Holmes.....Davenport.
O. W. Kulp.....Davenport.
Samuel Lorton.....Davenport.
Henry Lowe.....Davenport.
Thomas Nissen.....Davenport.
Chas. Daunacher.....Davenport.
James Dyer.....Pleasant Valley.
O. W. Dickenson.....Grinnell.
W. O. Willard.....Grinnell.
A. G. Williams.....Chester Center.
John Rackster.....Gilbert.
W. B. Gregg.....West Liberty.
Chas. Pickering.....Davenport.
A. Branson.....West Branch.
C. P. Osborn.....Fairfax.
Wm. Ure.....Fairfax.
Jacob Kimm.....Watkins.
H. Strohm.....Iowa City.
F. McClelland.....Cedar Rapids.

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Henry G. Higley.....Cedar Rapids.
Wm. Langham.....Cedar Rapids.
F. Lucas.....Cedar Rapids.
C. W. Burton.....Cedar Rapids.
Geo. Baumgardner.....Cedar Rapids.
Geo. Van Houten.....Lenox.
L. W. Clements.....Pleasant Valley.

The Committee on Resolutions reported, thanking the retiring President for the years of faithful service he had rendered the Society; the local committee for arrangements for the meeting and visit to Academy of Science, the Arsenal, Moline, Rock Island and other points of interest; to citizens of Davenport for courtesies and entertainment; to the Colonel commanding the Island for permission to visit buildings and other points of interest on the Island; the St. James Hotel for reduced rates and accommodations; to the several railroads of the State for reduced rates. The meeting, while not largely attended, was a very profitable one for horticulturists; and visiting members will long entertain pleasant recollections of the pleasure they derived from the meeting.

Adjourned.

C. W. BURTON, *Secretary.*

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NORTHERN IOWA HORTICULTURAL SOCIETY.

OFFICERS FOR 1888.

PRESIDENT.

W. C. HAVILAND, - - - - - - - *Fort Dodge.*

VICE PRESIDENT.

R. P. SPEER, - - - - - - - - *Cedar Falls.*

SECRETARY AND TREASURER.

JNO. C. FERRIS, - - - - - - - - *Hampton.*

RECORDING SECRETARY.

ELMER REEVES, - - - - - - - - *Waverly.*

ANNUAL MEMBERS.

Edson Gaylord ..... Nora Springs.
C. L. Watrous..... Des Moines.
R. P. Speer..... Cedar Falls.
J. S. B. Thompson..... Grundy Center.
J. B. Mitchell..... Cresco.
N. A. Reeves..... Waverly.
E. M. Reeves..... Waverly.
Moses Robinson..... Waverly.
J. Wells ..... Steamboat Rock.
C. F. Bean..... Marathon.
W. Crawford..... Eldora.
W. C. Haviland ..... Fort Dodge.

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S. A. French.....Faulkner.
Geo. Packman.....Eagle Grove.
Geo. Rambach.....Cedar Falls.
J. M. Slossen.....Northwood.
C. H. True.....Edgewood.
E. K. Frost.....Chapin.
W. E. McAlpin.....Belmond.
John A. Beverly.....Eagle Grove.
S. W. Ferris.....Bristow.
Ed. Conners.....Humboldt.
J. H. Johnson.....Inwood.
M. R. Steele.....Decorah.
James Underwood.....Grand Junction.
J. A. Wahlford.....Hampton.
Wm. Koell.....Hampton.
W. H. Weltz.....Hampton.
B. F. Ferris.....Hampton.
Rev. J. W. Clinton.....Hampton.
Dr. O. B. Harriman.....Hampton.

HONORARY MEMBERS.

Mrs. Geo. Higley.....Hampton.
Miss Eva Jackson.....Hampton.
Amos Clark.....Hampton.
A. C. Boales.....Hampton.
C. G. Patten.....Charles City.
D. W. Mott.....Hampton.
Eugene Secor.....Forest City.

HONORARY LIFE MEMBER.

Peter M. Gideon.....Excelsior, Minn.

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Proceedings of the Northern Iowa Horticultural Society.

HELD AT HAMPTON, DECEMBER 7TH AND 8TH, 1887.

FIRST DAY—MORNING SESSION.

The Northern Iowa Horticultural Society met in its third annual session, at Harriman's Opera Hall, Hampton, Franklin county, Iowa, December 7th, and was called to order at 9:30 A. M., by President Patten.

Prayer was offered by Rev. Weaver.

After renewal of memberships, Peter M. Gideon, of Excelsior, Minn., who was present, was made a life member of the Society.

The Secretary's report was read, and was referred to a committee appointed by the President—Hon. C. L. Watrous, E. M. Reeves and W. C. Haviland.

SECRETARY'S REPORT.

Mr. President and Members—The Secretary finds but little time for reporting observations, hence the chief merit of this report will be its brevity.

A somewhat extensive travel in the Northern District has convinced me that the loss in orchard trees during the summer of 1887 is principally from injury inflicted by the winter of 1885-6. While the loss has been considerable, it hardly justifies the dismal wail which characterizes reports so far received from directors.

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The Duchess and Tetofsky are still faithful, indicating plainly the value of the Russians in our cold climate.

The Wealthy has given as much fruit as any variety of apple in the district, in proportion to the number in orchard.

In favorable localities many of the old list still give fruit. We had a number of them on exhibition at our County Society, September 11th.

Blackberries and raspberries were dried upon the canes, and hence, but a light crop was harvested.

Strawberries gave not more than half a crop.

Grapes bore abundantly, and gave great satisfaction. Every home should have a vineyard large enough to supply the children with delicious healthful grapes. If people will stop croaking of failures long enough to observe our successes and contribute something to the solution of the problem, we may soon be able to recommend a list of fruits for our district upon which may rely with certainty.

Our experimental work is invaluable but if the general public cannot be made to recognize its importance, the people will not be prepared to profit by the results. The want of harmony between agricultural and horticultural societies, is to be deplored. They are equally important to the farmer. Organizations of either branch should appoint committees to attend meetings of the other and report. An interchange of courtesies will develop a unity of interests. I would respectfully recommend an early preparation of reports by the secretaries of the several horticultural societies of the state and the passage of resolutions urging an early issue of the annual report. I must again protest that the secretary should not be compelled to take the responsibility of making the annual programme.

It is never satisfactory to all or even to any considerable number of those to whom subjects are assigned.

The Minnesota is proving a better bearer and better fruit than previous records indicate, and it is one of the hardiest trees in nursery.

A recent examination of fifteen varieties of Russians, develops five about as hardy as Wealthy, five as hardy as Duchess, and five hardier than either.

If they prove as hardy in their maturity as in their youth, the question of orchards in the north is solved.

Two American varieties seem very hardy in nursery. Scott's Winter hardier than Wealthy, and Harry Komp quite as hardy. This indicates that the planting of seeds may result in an occasional hardy American apple. Plums gave a partial crop with De Soto ahead, where of bearing age. The continual failure of the cherry crop and early death of the trees, leave us but little hope of any, but wild cherries until new varieties are tried and found worthy.

I would suggest that a committee be appointed early in the session to assign subjects for the next session, and that members be consulted as to their preference of subjects as far as is practicable.

Also, the several directors should be named in open meeting or chosen by a committee which should meet and act before close of session.

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I am much gratified that our society has made such progress, and attained such magnitude and practical usefulness.

I hope and believe it will live while north Iowa is inhabited by intelligent human being.

JNO. C. FERRIS, *Secretary.*

The seeretary read a resolution from the Delaware County Horticultural Society recommending an early publication of annual report.

RESOLUTION.

WHEREAS The transactions of Iowa's Horticultural Societies reaches the fruitgrowers too late for their guidance in spring planting.

Therefore, be it recorded, that we ask the cooperation of all Horticultnral Societies throughout the State, in requesting an earlier publication of our reports, so that said reports can be distributed on or before April 1st of each year and

That the secretary of this society send to the secretaries of all other horticultural societies in the State, a copy of this resolution for their consideration at their coming winter meetings.

E. B. PORTER,
Secretary Delaware County Horticultural Society.

On motion the resolution was adopted.

Paper of Chas. F. Gardner, Evergreens from Seeds and Cuttings:

EVERGREENS FROM SEEDS AND CUTTINGS.

CHARLES F. GARDNER, OSAGE, IA.

So much has been written on this subject that it would seem as if hardly anything more could be said that would be interesting and profitable to the general community. I cannot do the subject justice without repeating some things that I have already stated in writing previous articles.

The growing of evergreens from seeds and cuttings is a peculiar branch of the nursery business in which few nurserymen, even, care to engage in. How much less, then, should the ordinary farmer attempt it with a view to profit. Still, if any desire to do so, I will give them a few brief directions which if followed, will under ordinary circumstrances lead to success.

Make the beds four feet wide, running east and west, pulverize the earth

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thoroughly, it is well to cover the top of the beds with sifted soil. Make the beds slightly oval and raised about three inches above the general level.

Soak the seeds twenty-four hours in warm water, and then sow them on the beds so that the seeds will lay on an average about one quarter of an inch apart each way, cover the seeds with clean sifted sand about one quarter of an inch deep, cover the whole with a fine layer of larch leaves about one sixteenth of an inch in thickness. Cover the whole with lath frames; the lath should run cross-ways of the bed, that is north and south. The lath should be one inch apart and placed on frames raised about one foot in height, the south side, say ten inches, and the north side thirteen inches. (For explicit directions in making these beds see "Transactions of the Iowa Horticultural Society, 1884.) After finishing planting, if it does not rain immediately, at night take off the the lath frames and sprinkle the beds with water sufficient to moisten the sand on top of the beds, put the lath frames back and repeat the process every other night until it rains. After a good rain I never water them again. Pick out all weeds as fast as they appear; do not wait until they are two or three inches high; pull them up as fast as they appear. The trees in these beds are usually transplanted at two years of age.

Arbor vitæ and the junipers are readily grown from cuttings; the cuttings should be prepared in September; a little earlier or later will do; and for convenience are planted in boxes two by three feet and four inches deep, filled with sand which is kept moist. The cuttings are planted very close together, say ½ by ½ of an inch. These boxes are kept in a frame like a printer's type rack and placed in the cellar and kept there until the cuttings are calloused and rooted, which will be the fore part of the next season; they are then planted in shaded beds and cared for the same as seedlings. The cuttings should be made about three inches long, carefully trimmed with a sharp knife, leaving only a small portion of the leaves near the terminal buds. The base of the cutting should be cut, not bruised. Pines, firs and spruces are more easily grown from seed than from cuttings. In preparing seed beds, or beds in which to transplant trees from the seed beds, I find that a liberal sprinkling of ashes is of decided advantage. The ashes should be spread over the ground as a preliminary operation so as to be well incorporated in the soil during the process of making the beds.

DISCUSSION.

C. L. Watrous: Thought we should obtain our seeds from the north as it takes time for species and varieties to adapt themselves to a new locality.

E. M. Reeves: I obtained white pines from the south and they were nearly all killed the following winter. I obtained red cedars from the north which held through the winter and grew and flourished.

Edson Gaylord: I have obtained black walnut from the south.

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They came up but all died, while those from Wisconsin nearly all lived.

B. F. Ferris: It seems to me there are two kinds of red cedar. I have observed a very great difference in form of tree and foliage.

Edson Gaylord: My Red cedars from Kansas and Tennessee all perished the first winter, while those obtained from northern Illinois and Wisconsin did well.

E. M. Reeves: I see no marked difference in the cedars from north and south.

J. C. Ferris: In the Rocky Mountains there are apparently two very distinct species of Red cedar. One is a mere shrub, growing on the hillsides. The other is a much more shapely and tall tree, and grows in the canyons. The color of the wood is different.

C. L. Watrous: Of course the tress at the foot of the mountains would be much more thrifty, as the altitude and different soil would affect them and they would be different even if grown from the same seed. The seed from the tree grown upon the river bottom would produce a more thrifty tree than seed from the more scrubby tree of the bluffs. But change the locality of either and the seedling will be modified by altidude, nature of soil, etc., and would in time adapt itself to its new enviornment. The human race sprung from the Mongolian, but by diversity of climate and surroundings have developed many very different races. Restore them all to the same temperature, etc., and they would become more nearly allied and similar in chaacter and appearance.

President Patten: Seedling production is a very important matter. We are mostly interested in trees of our own climate. The northern trees and seeds will go through our winters without harm. The Dent corn of Kansas can hardly be raised in the north. After a few years it will gradually approach the Flint corn of the north, while the northern corn taken to Kansas will soon become Dent corn.

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SEEDLING FRUIT.

BY I. S. B. THOMPSON, GRUNDY COUNTY.

Mr. President, ladies and gentlemen:

The question of seedling fruits of America, that has been assigned to me for a few remarks is the apple, the seedling or natural fruits of American origination. This field is too large to give but a passing report, or historical account of. I will only call your attention to a very small number of some that we are in possession of their history, those that are to-day being sought after and have proved themselves worthy of the acknowledgement that is being bestowed upon them by the fruit producers and consumers of America; for their high colors, large size, good qualities of the fruit, and of the hardy, thrifty and abundant fruitfulness; in tree surpassing all others in many of the leading fruit markets of home and abroad; and are widely located in our country; many of them are of very long keeping varieties—the very apple we are searching for to day; trees from fifty to one hundred years old, of great size of trunk, from two to four feet in diameter and forty to fifty feet high, producing from twenty to fifty bushels of fruit annually, and still retaining all hardiness of tree and fruit.

Such trees are in possession of the seedling fraternity of America to-day. And in the near future they will be acknowledged by the horticulturist as such, on account of their hardiness and abundant fruitfulness of beautiful specimens of these apples for all season, both winter and summer. Such as having been once sampled by man will forever afterward speak in their favor, as the very best of the apple family.

What have we to prove this statement? We have hundreds of seedling trees that have been producing every year from one to fifty bushels of choice fruit per tree, especially in York State near the old Indian villages, and pioneer residences of the eastern and northwestern States. Many of them are still the land marks of ages long since passed away, but the old seedlings are still there, and to all appearance hale and hearty as ever, giving annual crops of fruit of the choicest varieties. Are not those the American seedling apple? Most assuredly they are. If not, then tell me what they are, for they were in bearing long before the scientific grafters and budders were in practice here in the country.

Having been on exhibition at almost every meeting of the society for

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years, I refer to such fruits as the Thompson seedling, J. Barkers, G. A. Knowles, Peter M. Gideons, H. B. Teller, Woolsey and many others that are to-day living specimens of seedling fruits. See Report Agriculture 1886, by T. H. Hoskins, of Newport, Vt.; H. E. VanDeman, department pomologist, page 259 to 276. Fully fifty entirely new varieties of seedling apples are reported. Why, the wealthy apple is being shipped to England from Canada with profit to-day. And if we succeed in producing a few more seedlings of the wealthy stripe, of longer keepers; and we have the material among the present seedlings awaiting development sufficient to cover thousands of acres if judiciously handled in company with the best of the Russian varieties, grafted upon the native wild, crab root and the reproduction of the choicest of all fruits, the apples. So let every one renew their labors; and as our lamented brother, Suel Foster, has often remarked while in discussion, we will accomplish our object, which is the production of an abundance of the choicest of fruits; to place in the hands of the civilized world.

Let it be seedlings or Russians, both are at your disposal, and such are among the American seedling reproduction.

Here is one of the new seedling trees originated in Scott county, Virginia, in 1866, of unknown parentage and has for the last ten years been a steady bearer of fine winter fruit without blossoms and destitute of seeds or core, being solid throughout with a thread core in the center, dark red in color, and nearly sweet in flavor, medium size; flesh of an orange, yellow, and season May and June, tree healthy in that locality, but undoubtedly not fit for Iowa. Here is natures hand work for study for the pomologist and chemist to explain to the world. Still it exists and records in the American Agriculturist, page 555, December Number, 1887.

So we will plant seeds of our best fruits,
And raise trees that some lands may suit,
Which shall live their blessings to shed,
On millions of souls when we are dead.
Plant your best of seeds no longer be in doubt
That some beautiful fruits we will find out;
Fruits which perchance your name may enshrine
In emblems of beauty and life to shine.
Plant seeds of the beautiful seedling apple,
Yellow, green or red.
The children will speak for the choicest
Of blessings to rest upon the producer's
hoary heads.
Ah, but alas, the poor souls are dead.

DISCUSSION.

N. A. Reeves: I did not get Mr. Thompson's idea. If I send to England and get seed and plant it and raise a tree in Iowa, is it an

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Iowa seedling? I do not suppose Mr. Thompson's seeds were grown in Iowa.

Mr. Thompson: My seeds came from a sister State, and my subject was American seedling. Our Wealthy is an American seedling grown in a sister State.

Mr. Gideon: The Wealthy is from the seed of cherry crab. I planted about a teaspoonful which came up in great variety. From seed of the Wealthy I have raised the Peter apple, which is so near like it as to be hardly distinguished. I have produced many good apples from Wealthy seed, but for every good one a great number of very poor ones, ranging all the way down to the smallest and most pronounced crab.

Mr. Gaylord: I believe the Wealthy is a crab seedling, and probably all our apples are formerly of crab origin.

Mr. Thompson: I rise to vindicate my former position. That all the trees grown from seed planted in the west are American seedlings.

C. L. Watrous: The tree may be an American seedling though the seed originated in any part of the world. If from foreign seed it would be proper to call it an American seedling of foreign parentage.

Mr. J. Wells: I want all good seedlings put upon record. I have handled a great many trees. All good trees should go upon our records.

President Patten: That will be done by the committee appointed to revise the fruit list. That committee should have all possible light and arrange a list to be submitted to the Society. I wish to present a specimen and confirm the statement of Mr. Gideon. I have by crossing produced from crab seed an apple as large as the Wealthy or Duchess of Oldenberg. I have visited the orchard of Mr. Thompson and seen several seedlings of his orchard apparently as hardy as Duchess. Yet I hardly think the grafts from these will be as hardy as the original tree.

N. A. Keene: I want to know whether Mr. Thompson's trees were grown where the seeds were planted or have they been transplanted.

Mr. Thompson: They have all been transplanted.

Mr. Haviland: I received a letter from Mr. Patten. He reported his seedlings doing nicely.

Mr. Gideon: I got Boston seedlings and they proved hardy. I surrounded them by Blue Pearmain. I planted and grew several

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hundred. Among them I got many like crabs, but some of them were like Blue Pearmain. The trees which were so hardy had been transplanted. It does not matter whether the seeds are from large trees. It does not matter whether you plant the Wealthy or the Duchess if they are surrounded by others. They tend to cross bred seedlings. They will not make large apples, but the Wealthy will make large apples, also a clean junction when grafted on any tree. I have grafted the Wealthy on crab trees. The fruit was not large and few would not know they were Wealthy.

B. F. Ferris: The crab seedlings seem to be getting to the front, and I want to give a word of caution. We had a large lot of Minnesota seedlings; they sold readily, and we hoped much from them; they were good trees in nursery. Now hardly one of that lot is being grafted by us. Some have poor fruit; some did not bear any; some blighted, and some were tender. We should not plant crabs unless they have been thoroughly tested. I feel less safety in putting in crab seedlings than common apples.

Mr. Thompson: I am for cautioning people to be particular as regards the fruit. Though many keep trees in good style, they do not take care of the apples.

On motion adjourned until 1:30 P. M.

AFTERNOON SESSION.

Called to order at 2 o'clock P. M.

Telegram from Eastern Iowa Horticultural Society read:

To the Northern Iowa Horticultural Society, greeting:

May your meeting be as pleasant and profitable as ours promises to be.

To which the Society replied:

To the Eastern Horticultural Society at Davenport:

Your fraternal greeting received, We thank you, and hope all the blessings you ask for us may be returned to you ten fold.

Treasurer's report read:

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TREASURER'S REPORT.

Treasurer in account with Northern Iowa Horticultural Society:

DEBIT.

To balance due	$ 5 60
Twenty-seven annual memberships	27.00
One life member	5.00
Total	$ 37.60

CREDIT.

By stamps	$ 2.67
By stationery	2.50
By printing	5.50
By dray	.15
By for hall	11.00
By balance on hand	15.70
Total	$ 37.60

Balance on hand, $15.78.

O. B. HARRIMAN, *Treasurer*,
Per JNO. C. FERRIS, *Assistant*.

On motion the report was referred to committee.

Paper by J. H. Wohlford, "Planting and Pruning Grape Vines."

PLANTING AND PRUNING GRAPE VINES.

BY J. A. WOHLFORD, HAMPTON.

The planting and pruning of grape vines I consider the two main points to successful grape growing; and, by way of introduction to this article "I do not wish to be understood that I know all about the grape." I desire to tell what I have observed and what my experience has been with this beautiful and useful fruit that is so much admired by all.

First, I will give you the common method of planting and the success of grape growing all over the country.

Some day this winter the tree agent will come along and you order of him

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ten, twenty, fifty or one hundred grapevines; next spring you get them delivered all right, and they must be planted, but it is just at a very busy time and you cannot spare but a few hours to do it; so you take your rusty spade and manage to dig a hole about six by six inches and crowd the roots in on a heap, and presto, they are planted; then in a short time the weeds and your vines will have a discussion as to which has the most right to that particular plat of ground; finally the weeds triumph, and the vines are choked down; besides this, they are starving for the want of the proper material under their roots to make them grow. Then in a few years you wonder why you have no luck with your grapes; why they are dying; why they do not bear. The only wonder is that they live at all. I think all will admit that this is the true state of affairs in nine cases out of ten. For many of you know that the grape is my hobby, and in traveling over the country or passing through the city or village I always take notice of the grapevines, and the majority of them look very pitiful and neglected, indeed. But to make this paper of any value or benefit to this noble Society it is necessary to give my way of planting and pruning, the distance they shall be planted, and when they should be pruned. To plant, dig a hole not less than eight or ten feet in diameter and two feet deep; fill up this hole again alternately with the dirt and any kind of wood, such as logs, stumps, chips, bones, old boots, etc.; and when nearly filled up set in your vine, spread out the roots well, put a layer of very fine rotted wood on the roots, pour some water over this, finish up with dirt and tramp very solid; keep the ground perfectly clear of weeds or sod. Never plow nearer than twenty feet of your vines; never cultivate deeper than one inch; use a hoe for this purpose; let the sun shine on the ground to warm up and stimulate the roots. I never mulch. The drouth did not affect my vines the two past dry seasons, because they have plenty of the above material under them to gather and hold moisture. Grape trellises should always run north and south. Your rows should be eight feet apart, and vines thirty-two feet apart in the row; trellises to be eight feet high; three vines to start from the crown, two of these to run sixteen feet each way along lower slat of trellis, with arms running perpendicular from those to top of trellis; these arms to be from twelve to sixteen inches apart; the third vine to fill up the center.

Pruning should be done twice a year, in November and in June. Young vines should be cut back to two buds in November for three years. The fourth year put up your trellis and train as stated above. When your vine gets to bearing, you prune again in June, when the fruit is about as large as duckshot. Cut off all latterals at next joint to last cluster of grapes; but do not at this time cut off end of vine on top of trellis. Again in November cut off the end of vine to height of trellis, and all surplus wood. Much judgment, however, must be used in pruning. I believe that impoverished and starving vines, if not too old, can be made valuable by transplanting them as I have described.

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DISCUSSION.

B. F. Ferris: There are no large vineyards in the State where they allow the vines to climb so high. I prune twice a month for two months before the fruiting season. I do not let the vines grow over four or five feet high.

Mr. Gaylord: Mr. Rambach has a good grapery at Cedar Falls. He thinks it enfeebles grapes to prune much. It serves to weaken and degenerate the vine and prevents ripening in time for earliest market. I am not in favor of summer pruning. We should prune in the fall.

Mr. N. A. Reeves: I have known a large number of grape vines to be lost by summer pruning. I do not believe in so much pinching and pruning in summer.

Mr. Rambach: I do not know why, but know that summer pruning will keep the vines growing and not ripen the fruit. We may cultivate grapes too much.

Mr. Sexton: At the College farm we tried summer pruning, but did not meet with success. We keep the land very clean and the vines free.

J. C. Ferris: Mr. Wohlford makes the most of each vine and raises fine grapes. He has exhibited some splendid specimens in our County Society.

B. F. Ferris: Mr. Wohlford differs from other farmers in having his vines 8 feet apart and vines 30 feet apart on trellis. Others have their vines 4 feet apart, and get more fruit from the same space. We cannot get good enough results from the amount of ground occupied and labor expended.

Mr. Gideon: How long have his vines been in bearing?

Mr. Wohlford: Five or six years.

Mr. Gideon: I make rows seven feet apart and plant vines 8 feet, prune in fall, take off sprouts in spring. I have been plagued by mildew when cultivation was continued, but not when spring cultivation and fall plowing was practiced.

Mr. Wohlford: I practice the wide space and side growth to facilitate the laying down and covering of my vines for winter. When I cut the strings the vines are down at once and are not broken.

Mr. Thompson: Mrs. Hall plants the vines 16 to 18 feet apart, and has very thick, heavy vines along the lower wires, with new latterals

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running up. As winter approaches the vines are cut loose and covered with earth. People uncover vines too early in spring.

Mr. Wohlford: I have seen two or three corn-basketfuls taken from one vine. Could pick a corn-basketful without moving out of my tracks.

President Patten: In reference to discession, our thoughts should be directed to giving instruction to beginners. Plant deeply, cultivate early and thoroughly to the middle of the season. Pinch off all growth not needed.

Member: Would you pinch off the buds?

President: I would do no pinching, only the first sprouts.

Paper read as follows:

MOST PROFITABLE SMALL FRUITS FOR MARKET.

BY R. D. M'GEEHON, ATLANTIC.

As I find it impossible to be with you at your third annual session, I send you a paper on "the most profitable small fruit for the market," as you requested.

I have made small fruit and plant growing my special study and business for several years, and find this question hard to answer in a few words, if at all. There are many things to be considered; among them are soil, climate, distance to market, value of land, as well as many other things that will come to your mind, if you will study the question; hence what I say as applicable to Atlantic and vicinity will doubtless have to be changed for your locality and surroundings.

We are about 500 miles from Chicago on the main line of the C., R. I. & P. R. R.; 82 from Des Moines; about 60 from Council Bluffs and Omaha, with about a dozen towns within 40 miles of us, containing from 300 to 3,000 inhabitants—Atlantic containing about 5,000. My land is one and a quarter miles from depot and main business street; it is good, warm, upland prairie soil, part of it somewhat sandy; it is worth seventy-five dollars per acre without any improvements. I can get all the manure I want for the hauling from town. I also can get all the women and girls I need to pick the fruit from the time the first strawberries are ripe until blackberries are done for two cents per box. The price of strawberries in our home market has varied in the last seven years from 5 to 30 cents per box; raspberries, 8

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to 30 cents; blackberries, 5 to 30 cents; grapes, 8 to 10 cents per pound; currants, 4 to 12½ cents per quart. Chicago market price really governs about all products of the northwest, small fruit included, as 1½ to 2 cents per box will bring berries from Chicago here. The price of raspberries and blackberries has been more steady than strawberries, the general price being from 10 to 15 cents per box; but there is nothing like the same amount of them used. I have shipped strawberries to Omaha when our home market was overstocked, and realized only enough to pay for boxes, crates and picking. Never ship to a large central market when you have an overstock for home supply; better sell them in the small towns near home for what you can get. You should always raise all kinds of small fruit; pick it and market it in the best possible shape and condition, and do your best to build up a good home market; watch it closely and see what its demands are, and as far as possible supply them. In this way you will build up a trade you will hold; when the crop of one kind of fruit fails, you will have another to supply your customers. If you expect to be successful in raising small fruits for market, you want to make a business of it and give it your undivided attention, by planting all the different kinds of small fruits. It will give you steady employment from early spring till late in the fall. You must be ready to plant, cultivate and prune at the proper time and in the best possible manner, as well as pick your fruit at the right time, if you expect success.

I have sold the strawberries that grew on about five-eighths of an acre for $455, and the blackberries that grew on one-sixth of an acre for $162. Another season I sold the strawberries that grew on one acre for $57, and the fruit from an acre of Snyder blackberries brought $67. These were good crops and high prices, and poor crops (caused by severe winters and dry summers) and low prices. These are the extremes I have noticed in the last eight years.

The early varieties of all kinds of fruit (as a rule) bring the best prices. Moore's Early grapes this year brought 8 to 10 cents per pound, while choice Concord (when fully ripe) were dull sale at 8 cents. Tyler raspberry went quick at 12½ to 15 cents, and when Greggs came in they were dull at 10 cents. Red raspberries (of the suckering varieties) have never paid me expenses; it costs near double as much to raise and pick a quart of them as it does of the Black Caps, and people invariably think one quart of raspberries ought to be sold as cheap as another, regardless of color, quality or size. The Snowy Tree cricket for several years has bored the canes of the red varieties so badly that when summer came there was but few canes left with vitality enough to mature a crop of fruit. If we had any certainty of a fair crop of Snyder blackberries each year at from 8 to 12 cents per quart at home for them, (for the labor it takes to grow them) they would pay the best, but our last cold winters and dry summers has made the crop very uncertain. Some of our best horticulturists in Wisconsin and Minnesota grow good crops every year, by binding down the canes and covering them with earth, at a cost of from six to ten dollars per acre, and they say it pays well. If this can be done in Wisconsin and Minnesota

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it can be done in Iowa. Were I starting a 10 acre small fruit farm here, intending to make it pay me all the money I could, I would plant about as follows: One acre in grapes; two-thirds of it would be Moore's Early and Worden; the balance Concord, except a few Lady Delaware and Agawam for my own special benefit; 2½ acres to Snyder blackberries, with a small patch of Lucretia and Windam dewberry for trial; 3 acres in Tyler, Ohio and Shaffer raspberries, about equal quantity of each; one-fourth of an acre in currants, principally Victoria, with a few White grape and Fays. The balance of my ground I would plant to strawberries; two-thirds of these would be Crescent, with enough of Capt. Jack, Downer and Mt. Vernon to fertilize the Crescent. I would plant a small patch of Jessie and Bubach to test these two last varieties.

The varieties of all fruits here named do best here. Soil and locality and climate, of course, will make some difference in the varieties to be selected.

DISCUSSION.

Mr. Wells: Has any one knowledge of Lucretia dewberry?

B. F. Ferris: I have had it growing two years. I think it will do well if covered, which is easily done. It has been fruited near here. It is finer looking than Snyder blackberry, and makes a better appearance in market. I do not think it produces so much.

President: I have seen the dewberry growing in the garden of Mr. Fluke of Davenport; do not think it has so fine a taste as the other berries. It is very tart.

Mr. Bean: Does the dewberry need fertilizing?

President: I think not; although they may have been fertilized on Mr. Fluke's ground.

The following committees were appointed by the president:

Committee on Revision of Fruit List—W. C. Haviland, W. O. Reese, S. W. Ferris, J. H. Mitchell, C. H. True.

Committee on Special Premiums—Hon. C. L. Watrous, Geo. Rambach, Elmer Reeves, Allen Green and Edson Gaylord.

PRESIDENT'S ADDRESS.

Members of the Northern Iowa Horticultural Society:

I shall not attempt to point out the valuable items of progress that you have made during the last year, but shall leave it to your discussions to develop the good that has been accomplished.

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That we are passing through a trying period is apparent to all. But the reasons for hope in permanent and gratifying progress are, I believe, to every observing horticulturist, equally apparent.

Progress in a difficult problem presupposes intelligent and persistent thought and effort, and I hope that I may be able to direct your attention to a few of the ways whereby we can advance the horticulture of our District and State; and, as the nurserymen are an important element in this Society, and pecuniarily as well as morally interested in the growth of horticulture, I desire to call their attention to at least two of the ways in which they can promote their interests and the interests of their patrons.

First—By planting, as far as possible, and cultivating in a thorough manner, every variety of fruit or tree that they are advising the public to plant.

I believe it to be the duty of every propogator to demonstrate by practical experiment, as far as possible, the value of the article that he offers for sale.

To illustrate: If a nurseryman believes that the Moors' Early Grape, or the McMahon apple is a valuable addition to our list of fruits he ought to plant them at once, and give to each appropriate and thorough care, and thus demonstrate to his neighbors and the general public the value of his wares under proper treatment. Much of such work is already being done by nurserymen, but more of it can be and ought to be done, both for the moral and pecuniary interest of horticulture.

I want to give especial emphasis to the idea of thorough culture. None other can do justice to the thing that we are planting, or be a credit or a benefit to the planter, or be a proper example for the public.

A second and important means for advancement, is the use of the press. In no other way can the public be so easily and fully reached. Horticulturists should write for their county papers. Editors would gladly publish the experience of practical men, detailing their methods of growing and caring for shrubs, ornamental trees, fruit trees, grapes, and all small fruits and flowers, with names of best varieties of each, and with best soils and locations for each particular sort. If nurserymen would properly regard their pecuniary interests, they should be particularly active in this work. Let the public see that they are willing to impart reliable information, and advertisements will be responded to in such a manner as will increase their appreciation of the value of their county papers.

I have often heard it remarked that there is a noticeable absence of young members in all of our western societies, and I know of no better way of interesting the boys and girls in practical horticulture in all its branches, than through the home papers. Many a boy or girl has horticultural tastes where the parents have none, or, having them, they are repressed by a multitude of other cares. Articles from the home fruit-grower or nurseryman will soonest arouse these tastes into activity, for the reason that they are at home, or so near home that object lessons of which they write can be seen with but little trouble. Write up these subjects, and many a home ground that is barren of trees and shrubs, and fruits and flowers, will, in a few

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years, through the active interest of the boys and girls, be adorned with them.

Horticulturists should be students in their calling; they should at least give as much intelligent thought to the breeding of plants as the farmer does to the breeding of stock. Cross-fertilization and hybridization, whether by artificial or natural selection, should be intelligently and persistently regarded in our efforts at improvement. Improved hardiness and every other desirable quality is within the grasp of the thoughtful, earnest and persistent experimenter.

Plant the best seeds, friends, of the best flowers and fruits and trees and yourselves and your children will bless and be blest by the effort.

I would not knowingly say anything that would tend to prevent in any degree the fullest and freest discussion in any line of our work.

But you will doubtless pardon, to some extent, a repetition of myself, when I say that if I have been considered over enthusiastic, or as some would put it, "cranky" on the subject of seed planting, let me say to you now, that after the most mature deliberation, if I could emphasize in a tenfold ratio all that I have ever said or written in favor of a large and general planting of the *very best seeds* of the *best fruits*, I would do it with the greatest pleasure, and with the fullest assurance of the most beneficial results.

Our State has wisely granted financial aid to the State Horticultural Society, and with equal wisdom may the State Society contribute of its funds for the development of the horticultural interests of the three District Societies. Make these Societies strong, and the permanent progress of horticulture in Iowa is assured.

To this end I would recommend that this society respectfully ask of the State Society that it make to the Northern, Eastern and Western Horticultural Societies an annual appropriation of at least fifty dollars to be expended in premiums, or in such other ways as the wisdom of each society may direct.

In concluding permit me to say that the opportunity seldom comes to a young society like ours, to extend its influence and make a record that shall at once place it in the front rank.

If the lists of fruits adopted by this society, for the next five years are the results of our very best thought, they will from the nature of the climatic conditions of district, be widely quoted wherever hardiness of trees and plants are especially desirable.

President's annual address being read was referred to committee on Secretary's report.

Treasurer's report referred to same committee.

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REPORT FROM WOODBURY COUNTY.

BY I. W. STONE.

Mr. President and members of the Northern Horticultural Society:

Your Secretary notifies me that I have been chosen to report the fruit crop of Woodbury county. I regret that the date of your annual meeting comes too late for me to attend, as I leave November 29th for Montana and California, and expect to spend most of the winter in the fruit districts of California.

Woodbury county is far from being a fruit district as yet. Very few apples of any variety were grown here this season. The Duchess and Wealthy gave about one half crop. Transcendent crabs were a very fine crop. Miner plum gave light crop, but were larger and better in quality than usual. Strawberries were good in quality, but light crop; Crescent as usual ahead in quality. Raspberries and blackberries, where winter protection was given, gave a bountiful crop of nice fruit. The Ohio, Souhegan and Tyler raspberries gave a fair crop without winter protection, but the Gregg, where not covered, was a failure. With proper winter protection my crop of Greggs was the best I have grown in ten years. Currants were a total failure on account of late spring frost.

It is very important to the successful growing of small fruits that the plants go into winter quarters in good condition, having good strong fruit buds, and it is just as important that they be well protected from the cold and drying winds of the northwest.

The successful dairyman does not leave his herd of cows out on the prairie with nothing but a wire fence or straw stack to ward off the piercing winds of a northwestern winter, nor does he depend on a timber belt for protection, but he well knows that he must give them a warm stable throughout the winter if he would retain their vigor necessary for a profitable season. This is equally true of small fruits. If we wish to retain the vigor of our fruit plants and buds we must protect them from the extremes of our winters.

There are many of the hardier varieties of raspberries and blackberries that will pass through an ordinary winter in fair condition without any winter protection except snow, but close observation will show a great loss

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of vigor when compared with those which have been properly covered. While the former will start a promising crop of fruit, but as the season advances the berries may be seen drying on the bushes, and if any ripen they will be under size, and the partial or total failure is usually assigned to dry weather; but when with a row of the same variety by the side of the former with the same care, except proper winter protection, we see all of the canes loaded with large, evenly ripened berries, we conclude that it pays to give good winter protection.

DISCUSSION.

B. Ferris: I have grown all kinds of small fruits and do not cover my currants and gooseberries. I cover all other small fruits.

Mr. Gaylord: I covered my blackberries and they dried up very badly. I want to find some one who has had a crop of Snyder blackberries this year.

Mr. Mitchell: I had no success with blackberries at first, but since practicing have raised good crops every year. Care should be taken not to cover too early.

Mr. Gaylord: I would ask if you protect them from the sun?

Mr. Mitchell: I did not. My vines blossomed and set full, but they were rather small and dry. I pinched canes back to about three feet.

J. C. Ferris: Canes may live through the winter without protecting, and yet have health so impaired as to not mature their fruit. They are not so well able to withstand drouth or other adverse conditions if exposed to the severity of winter.

Mr. Mitchell: My experience is similar to that of Mr. Ferris.

Mr. True: The vines which I put down show more vitality and put out leaves earlier. They were more vigorous last season than those not covered. The latter did not do much, but the former did fairly in fruiting.

Mr. Bean: How are we going to cover raspberries?

B. F. Ferris: I cover them the same as blackberries by throwing on loose hay.

Mr. President: I cover my blackberries in a way to save time and labor. Cannot make blackberries bear a crop without protecting them. I place a deep furrow from the vines on one side, near the roots, then lay the vines over and plow back one or two furrows onto the canes. I think raspberries can be successfully treated in the same manner.

Mr. True: Will there not be great danger of breaking the canes by plowing so near them?

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Mr. President. I think not. I believe we could raise a good crop by cultivating all through the seaon.

Mr. Gaylord: Is thorough cultivation preferable to mulching?

Mr. Patten: I think cultivation preferable.

Mr. True: I had three-fourths of a crop this year and got fifteen teen cents per quart.

Mr. Gaylord. What kind of soil had you?

Mr. True. Clay loam timber land. Blackberries should have a southern exposure.

REPORT OF PALO ALTO COUNTY.

BY CHAS. D. PRICE, RUTHVEN.

The past year taken as a whole has beeu satisfactory to the fruit growers in Palo Alto county. The young orchards are coming into bearing, and most of the farmers are getting small fruit gardens started, and are being well paid for their trouble. The varieties of apples that have given best satisfaction are Duchess, Whitney No. 20 and Wealthy. The Wealthy has made a good record in northwestern Iowa; it comes into bearing young, and is our best late fall variety. The hybrids and crabs that have fruited and done best are Minnesota, Gen. Grant, Brier's Sweet, Early Strawberry, Hyslop and Transcendant, the last named variety is subject to blight.

Of small fruits, the strawberries were plentiful and of fine quality, and good prices were obtained. I had in about one acre and sold the fruit by the crate at twelve cents per quart. The varieties giving best satisfaction are Crescent fertilized with Chas. Downing, Downer's Prolific or Wilson.

The Concord takes the lead in grapes, but Janesville, Moore's Early, Worden and Pocklington, do well here, and will be more extensively planted when better known.

Of gooseberries the Houghton is the leading variety, but they are not profitable; they are too shy in bearing.

Of currants the yield was about an average crop. The varieties most grown are Red Dutch, White Dutch, White Grape, Cherry and Long Bunch Holland and a few Fay's Prolic. The Long Bunch Holland does best when set on low land, and if kept well manured one bush will produces as much fruit as five or six of the Red Dutch with the same treatmeut.

Raspberries were about three-fourths of a crop, on account of dry weather. Doolittle, Mammoth Cluster and Gregg are the most common varieties of the Black caps, and the Turner and Cuthbert of the red varieties

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The Turner takes the lead, and pays well when kept in narrow hedge rows and well mulched to keep down the weeds and keep the ground moist.

The Snyder blackberry is the only variety raised. When well cultivated in the fore part of the season, and not allowed to grow more than two or two and a half feet high, and covered with hay or straw in the winter, will produce a good crop of fruit if the season is not too dry.

But few evergreens have been set out for wind-breaks in the county, and I see but few for ornament, except in towns. The farmers use principally willow, and in the summer and autumn the leaves and branches are covered with caterpillars. The artificial groves are mostly Cottonwood, Soft Maple and Box Elder.

DISCUSSION.

Mr. Reeves: How will the long bunch Holland compare with Victoria?

Mr. Haviland: Long bunch Holland will keep late, but the Victoria is the best currant ever grown. The long bunch Holland does not do so well with me.

S. W. Ferris: I believe the currant referred to in the report is the Victoria, as I have known that mistake to be made in other cases. The Victoria has done the best of all currants in the Northwest.

Mr. Gaylord: If the Gen. Grant crab is recommended, I want to say it is a worthless thing and does not bear.

J. C. Ferrris: I do not think the Grant crab is desirable for fruit, but it is certainly an immense bearer, and large. It bears well in Dakota, and is a good tree there.

Mr. Gaylord: The Grant crab may do well up at Ruthven, but I think it will go up in two or three years.

Mr. Thompson: I once bought four crab trees; two of them proved to be excellent, and two worthless.

REPORT FROM ALLAMAKEE COUNTY, IOWA.

BY JOHN F. DAYTON.

To Northern Iowa Horticultural Society—The season of 1887 was marked by severe drouth and excessive heat, which, following the dry season of 1886,

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materially affected the fruit crop. Strawberries suffered most, producing only about one-sixth of an ordinary yield under favorable conditions.

Raspberries, where given frequent cultivation, yielded from one-half to three-fourths the usual quantity.

The blackberry crop was very light. Currants did fairly, where well mulched.

The orchards in this county, except of Duchess of Oldenburg and some Russian varieties, have died, the crop this year being only of Duchess and crabs.

Plums bore fairly well. Grapes, mostly Concord, a full yield.

On motion adjourned until 7 o'clock.

EVENING SESSION.

Society called to order by President at 7:30.

ADDRESS OF WELCOME.

BY MAYOR A. T. REEVE.

RESPONSE.

BY HON. C. L. WATROUS, DES MOINES.

Ladies and Gentlemen—It is a pleasant task to respond to the appreciative talk and cordial welcome which has been given us. I suppose no one in this country, or in the world, who has the benefit of the horticultural societies and their influence, but what shapes and adorns the homes by raising beautiful fruit for our tables, for our nurseries and windows, and make life happy in advance by adorning and beautifying the home.

We came not here to feed on the good things which delight the body. We

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came to cultivate and encourage a better taste for adorning our homes. We have so many things to keep joy and pleasure within our homes.

We in Iowa have difficulty in perfecting fruits and flowers. The flowers of the coast have the influence of the ocean. Here we are 500 miles away from the sea. We tried many, and those which survived are the fruits of to-day. If the Society will do all it may to benefit us, all the farmers will be blessed by our labors. It can be advanced by seedling production. If we cultivate the seed, we can produce fine quality and advance the variety. This Society helps the community and the country.

The Society hopes you will always be a happy commuity, and that it will be with you often.

TREES FOR SHADE AND ORNAMENT.

BY J. M. ELDER, CONCORD.

Every tree is a shade tree to a greater or less extent, and in my opinion all are ornamental. If this be true, all that seems necessary is to induce our people to plant trees and care for them afterward.

I am aware that writers and speakers on occasions like this are expected to present formulated and concise directions for the attainment of that which would seem best in the assigned topic, and in attempting to fully discharge this supposed duty, I believe the greatest failures occur. To do this something, we are apt to follow our imaginations to such an extreme, especially in the beautiful, that a line of procedure is marked out which is utterly impossible for the majority of our people to adopt; and, indeed, rarely if ever practiced by the proposer. Those glowing pictures are better adapted o the illustration of fairy tales than to practical life in northern Iowa.

The benefits and blessings of tree culture in this country must largely arise through the exertions of those who have the least time and means to devote to any purpose outside of direct bread winning. With such, the best we can hope to attain, is a small amount of the beautiful, with a much larger of the useful. Therefore, if our recommendations and plans are to have practical value, they must in themselves be practical. The presence of a single tree is in pleasant contrast to the barren spot upon which it grew. Then let us induce tree planting, first making quantity a consideration, and afterward kinds. If the Larch, pine, spruce or fir cannot be obtained, the willow, maple, box-elder, or even the black walnut can, all of which are ornamental, to say nothing of their usefulness.

My short practical task will be directed to the average purchaser of wild land for a home, and whose principal means will be expended in the payment

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or partial payment thereof, and by the cheapest necessary improvements by which himself and family can occupy the same.

1st. If the only road or building site is on the north or west line, on no account erect the building nearer than twenty rods of such line. If by such location a full view of the highway may not be had, will be fully compensated in genuine comfort later.

2d. Plant no trees for protection against winter storms nearer than twenty or twenty-five rods of your buildings. The presence of wind-breaks in the immediate vicinity of buildings for many years only invites and secures the foe you are fighting, viz.: The huge drifts of snow; and further, if the grounds around the house are occupied by such growth, the ornamental will of necessity be excluded.

On account of the ease of culture over the natural disposition to sprout, I know of nothing equal to the White Willow for these outside groves, and when planted in rows six feet apart and eight or ten rods in depth, the question of protection is soon settled once forever and the home grounds a subject for ornamentation.

I will here remark that if during these few years, the owner of the lands on the north and west, has protected your buildings by the planting of groves and you desire a more extended view. The value of your tree growth will well repay its removal.

The outer space of the inner grounds may be devoted to orchard and small fruit purposes in which no forest or shade tree should ever appear. The inner, or grounds in the immediate vicinity of the house entirely to shade and ornamental trees, and here arises the question of taste and ability.

My own views which are within the means of nearly all, would be to intersperse evergreens and our own most desirable foliage trees. By such course the grateful shade of summer and a pleasant relief from the bleakness of winter will be obtained.

The hard and soft Maple and the Box Elder will well fill the bill for shade trees. The first though a slow grower, until after fifth or sixth year affords an autumnal foliage found in no other tree. The density of foliage of the soft Maple and the enduring properties of that of the Box Elder, and known to all and will never be too highly appreciated. The Norway Spruce, Scotch Pine and White Cedar are of easy growth, and for the agreeable winter contrast perhaps as good as any. As a summer shade tree the fashionable grown evergreen is a vexation since the lounger who cannot get under its lower branches is compelled to move much too often for convenience.

I believe if these simple recommendations are followed at commencement, many homes would be ornamented by tree culture that are now disfigured by lack of system and sense displayed in the haphazard manner of general plantings and at no greater expense.

If by accident or carelessness trees become injured by fire, the best thing to do is at once remove them and plant anew. This is especially true of the willow which if affected by fire as a tree is ruined forever.

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BEAUTIFUL TREES.

BY MRS. D. D. ENGLIS, OF HAMPTON.

[Copy not furnished.]

President Patten: The very able paper is before you for discussion.

DISCUSSION.

C. L. Watrous: I think we must regret that we shall never see the purple leaf beech here. I have tried to raise them, but the soil and air are so dry they do not grow. They can raise the great Red wood of California at Colchester, N. Y., or in England, but not here. But we can have beautiful trees here. We must be content with our native trees. Select the prettiest and take care of them. We grow the Sweet chestnut near Des Moines.

President: I wish to refer to some beautiful trees adapted to this climate: The Cut-leaf, White birch is grown in Northern Iowa, and is a beautiful tree for ornament. The Weeping spruce, known as Hemlock, when grown in open yards are beautiful. The Silver spruce of the Rocky Mountains is beautiful, and more hardy than Norway spruce. The White spruce is a long-lived tree, and beautiful.

Mr. Underwood: In reference to planting to beautify our homes we need not despair. There are many varieties of trees that can be planted here. The Catalpa is a native of the south, and has been gradually brought north. Also horse chestnut, which I have seen on Des Moines river 75 or feet high, and 2 feet in diameter. White pine for beauty and practical benefit has no equal. It is the tree for Iowa. By turning our attention to those trees which can be grown here, we can compete with Europe in the beauty of our landscape. Red cedar is also a fine tree, and by proper training can be formed into hedges to beautify our homes.

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ORNAMENTAL SHRUBBERY.

BY MRS. J. W. MYERS, OF HAMPTON.

Much has been written about beautifying the home; and many "graceful hints" given to the wife and mother about always smiling on husband and children, and about preparing their favorite articles of food, and making home pleasant generally, for others. I confess to having seen one or two articles about a husband's duties in the latter direction also. In fact, the good obedient daughters of earth, have so far followed out these "hints" that a cross, ugly tempered woman is hard to find. Now that these faithful, smiling women should be made truly happy, we suggest a slight reward for their pleasant smiles and cheerful manners. There are few women who do not love flowers, whose hearts do not yearn for their beauty and fragrance, as, witness the laborious work which so many perform to keep a large number of beautiful window plants, where the eye rest on them. How much of this burden during summer, might the husband take upon himself by the judicious planting of flowering shrubs. By a careful selection of less than a dozen varieties, flowers may be had during the whole summer season. Let me speak of those which will grow in our own country For early spring time we have the fragrant flowering current, the almond, with its white and pink blossoms, though the white seems less hardy for this climate than the pink. Place near the house beds of pansies, fleur de lis, tulips, sweet Williams or pinks, which will give daily delight; and well repay, by their beauty and fragrance, a little trouble in the care of them. There are two or three kinds of lilacs, the common, the white, and Persian lilac, all beautiful and having fragrant blossoms. Many prefer the Persian lilac as it usually has more blossoms, and its leaves do not mildew or turn white during the latter part of the summer. Then at the same time comes the beautiful snowball, and its small sister the snowdrop, and the tree honeysuckle with its fragrant pink blossoms. Choose some place in your yard for its clinging sister, the trumpet honeysuckle. Build a little arbor for it to clamber over, and within which the children may have a pleasant shady play house. It is a perpetual bloomer, and will give you a succession of beautiful scarlet blossoms all summer, and they will be succeeded by clusters of red berries which will remain till after snow falls.

Plant a purple flowered Jasmine by a window, a Syringa near another, and an open window will allow their fragrance to fill your rooms. Find a place for the Wiegelia, one of the finest flowering shrubs for the yard, and you

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will not regret it. Let the Woodbine or purple flowered Clematis or "Virginia bower" as it is sometimes called, or the Wisteria or Virginia Creeper, clamber over the porch.

Need I urge you to plant the rose, the "queen of flowers?" The moss rose, the grand "Prince William and Mary," the fragrant cabbage rose, the seven sisters, the delicate little Scotch rose, the blush, the yellow rose, we love them all, and wish they were more hardy.

One of the pleasantest recollections of my childhood is of a hedge of roses separating the vegetable garden from the lawn. The beautiful roses! No wonder the historian, Bancroft, loves the rose and loves to wander among them and gather inspiration for his writing.

Most varieties must be covered with a light covering of straw. Though the yellow rose has proved hardy enough for this climate without a covering in winter, and seems to have fewer insect enemies than many of the others.

We admire a beautiful lawn, but fear the lawn mower is driving the shrubbery from the lawns, for it is some tronble to mow around them.

Said a lady to a friend: "Why do you keep so much small fruit in your yard? you surely do not can it all?" "No;" was the reply; "I need some, and I want my children to eat all they wish to, at any time, every day, and invite their little friends, too, and never feel tempted to reach through a fence to pick a berry or any kind of fruit belonging to another."

The same rule will apply to flowers. Have plenty at home for your children. Flowers add so much to the beauty of home. Now the faithful, kind-hearted and obliging husband cannot procure all of the above mentioned shrubs in one year, but by perseverance year after year, will have flowers to delight the eyes of wife and children, and furnish boquets for teachers and friends, and he have the reward in a happy family.

J. C. Ferris: The paper just read is valuable in treating of shrubs adapted to our climate. Every flower named can be grown in Hampton. Yet I think the white flowering almond quite as hardy or hardier than the pink.

Mrs. Myers: I have found in experience that the pink almond is hardier than the white; I have had some difficulty in getting the white to grow.

Mr. Watrous: I must sustain the lady; I have always had the white and pink, and have found the pink hardy, but have had trouble with the white.

N. A. Reeves: I have found the white hardy, while the pink has to be protected.

Mr. Reeves: In villages and cities much more attention is given to flowers than on farms. We, in Bremer county, have had to contend with it. We have no time to devote to the cultivation of flowers. I have seen farms with buildings very fine, and surroundings the same.

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The owner of one makes his home beautiful by cultivating flowers and shrubs; he will spend ten dollars for flowers; the other will spend ten dollars for pigs. What is to be done? The one that purchased the pigs feels as if he is unjustly treated. It is too expensive for him to grow flowers in his yard. My brother sold his farm and went to California for this reason. He had to pay from three to five dollars more taxes than his neighbor, because he had flowers in his yard, while his neighbor had pigs.

Mr. E. M. Reeves: Perhaps the difference in almond was in the plants; they may not have been good ones. We have had no trouble with the white ones.

President C. G. Patten: The white almond has proved to be very hardy. I have some five feet high. I think there must have been some defect in your white plants, as the pink does not succeed so well. If kept in a yard they will do well; the same will hold good with the pink, but they are not so hardy. I think Mr. Ferris voiced the sentiment of the Society on that question.

Mr. E. Gaylord: We grosser mortals do not take to flowers so kindly. I think we should have our boys cultivate a taste for flowers.

Mr. ———: I suppose the gentlemen do not have time to take care of so much shrubbery. I have two or three long rows of paeonies. I do not spend one hour of time during the year with them. They have a thousand flowers on them. I place mulch and trash around them. There are two kinds of phlox which need but little care, and will have a perfect shower of blossoms.

Capt. C. L. Watrous: *Hydrangia Paniculata Granda flora* is very fine. They are a perfect globe of flowers, something like almond. It is a small white flower; a purple pink; cover with straw or leaves and it will keep. Snow-ball (*Spirea*) grows taller than a man's head; its foliage is of a golden color. Rose (*Acacea*) needs but little care.

Mrs. Myers asked about *Spirea*.

Capt. C. L. Watrous: They will not do as well in sod; rotted manure must be placed around it. So many different kinds it would be hard to tell about them. I spoke of the smaller ones.

Mr. E. Gaylord: The yellowish white *Spirea* is beautiful and sweet scented. It blooms profusely and grows six or eight inches high.

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PRIMITIVE FRUITS.

BY JOHN W. CLINTON, A. M.

What motive led to the assignment of this subject to me I am unable to conjecture. At first glimpse it would seem easy enough to frame an article concerning primitive fruits. I am thoroughly unqualified to enlighten you upon this subject. The trouble with me is I attempted to study up on the matter. If I had written without that study I would have been more confident. An ignorant person never lacks verbiage nor cheek. The less he knows the more he can talk or write. The more he knows the more humble, retired and less confident he becomes.

We will commence with some definitions. Much is lost in the consideration of any subject by not understanding the terms. "Fruit, in a wide sense, is the perfected ovary of a flowering plant with its proper envelopes." That definition, to an ordinary person, is a stunner. Take any common rustic and hurl this definition at him and he will comprehend it about as intelligently as a backwoods untutored Indian would the complex machinery of a well finished locomotive. Suppose you try it. Put on all the dignity of a college professor and address a class composed of country clod-hoppers or street Arabs, all of whom have what they understand to be definite ideas of an apple, plum or peach, and say: "These apples are the perfected ovaries of a flowering plant on enclosed in its envelopes," And then imagine the gaze and the stare and possibly the reply, "What did you say, governor?" "What kind of a racket is that you're gettin' off, eh?" "We've raised apples, eaten them and stolen them, and we never dreamed of them as perfected ovary. What do you mean?"

The word "primitive" is from the Latin, *Primus*, first. Putting these two definitions together we have "the first fruits" That may mean the first fruits mentioned in history, or it may mean the original species.

In case it means the former we will take a slight glance at that view of the case. It appears that the first fruits mentioned in ancieet history were figs, almonds, peaches, oranges, citrons, apples, pears, cherries, plums, quinces, gooseberries, grapes, pomegranates, mulberries, strawberries, currants, raspberries and nuts. Of this early record of fruits most of them will be of interest to us as they are nearly all produced in this or adjacent latitudes. Our zone of the earth is the only one that has produced the intelligent peoples and nations of history; and it would make very intelligent reading to note the many varieties that have arisen out of the above men-

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tioned by crosses or hybridization. Back in early history, say about 250 years after Christ, we have record, among horticulturists, of 22 sorts of apples, 36 varieties of pears, 4 kinds of peaches, 3 sorts of quinces, 4 varieties of apricots and almonds, 2 of plums, 8 of cherries, 4 of olives, 1 of grapes, figs, oranges, blackberries and strawberries and 2 of mulberries. Most of the above were cultivated; some of them grew in a state of nature. Of the latter was the strawberry. They grew so abundantly and so well in eastern Europe and Western Asia, in a wild state that only one variety seems to have been known, and that was most likely the wild strawberry of our country. It was likely larger and more abundant there owing to the favorable conditions of soil and climate. The incentive to improve on the strawberry would not exist, for he that has gathered and eaten the wild strawberry knows full well that its flavor is *ne plus ultra*. In this fruit cultivation has not gained us much. What we have gained in size we have lost in flavor. Nature made a climactical effort when she put the taste or flavor in the wild strawberry. To horticulturists the wild strawberry is what the potato was to a certain Irishman who was always extolling the superior quality of that tuber, much to the annoyance of an associate Englishman. One day he said in the wildest feeling of thankfulness, "What a blessing that God made potatoes!" The Englishman said gruffly, "If he had not made potatoes he possibly would have made something better." The Irishman wittily replied: "Be jabers it would have puzzled him." The Irish and the English never could agree.

In 1629 Mr. Parkinson, an English horticulturist gave in his treaties on varieties of fruit fifty-eight varieties of apples, sixty-four of pears, sixty-one of plums, twenty-one of peaches, five of nectarines, six of apricots, thirty-six of cherries, twenty-three of grapes, three of figs, besides some varieties of quinces and nuts.

The English and French were the pioneers in the production of the best and greatest varieties of fruit. The Spaniards and Portugese caught their methods, and these four nations were instrumental in giving to America an advanced knowledge in horticulture. The Jesuit fathers introduced the grape, the cherry and the apple in their advanced cultivation into Virginia, Mexico, California and other countries. On the plateau near Santa Fe is a grape vine planted by the hand of a Jesuit father, now nearly three hundred years old. How much we owe these pioneers! This has enabled the United States to become the most advanced in horticulture of any part of the world. The grape, the apple and the cherry grew in this country in a wild state. We did not have to rescue them from this wild state but took advantage of the experience of the old world in our start. In the southern portions of our country the Pine apple, oranges and lemons gave to the prophetic fancies and dreams of the ancients a country that was blessed with

"Trees of life and fruits of Gold
Like the Hesperides of old."

The first obtainable list of the varieties of fruit in the United States was given 1798, and it indicates one hundred and thirty-three varieties of apples,

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six of apricots, fifteen of cherries, five of nectarines, thirty-eight of peaches, sixty-six of pears, eighteen of plums, In 1815, we still had a more complete showing of statistics, and now the interest taken in this department shows an almost endless variety in the more common fruits.

Suppose we take that view of the subject that treats of the original species. This places us in quite as distracting a *dilemma*. This possibly is the field my horticultural friends desired me to enter. This field is either classic or aboriginal. It is classic in its age, and it is aboriginal in its primitive conditions. The classic student is subsequent. The primitive conditions antedate the schools or the beings who make scholars. So however classic we may be it reaches beyond our knowledge or power of knowing to show the origin of the species. Men have tried this. They have conjectured that the known or knowable laws of nature produce the species or *genera* and that somehow by some kind of evolutionary process that the species are evolved from a simpler and a primordial state of things. Of this, says Mr. Darwin, though he favored that view, we have no positive proof. He says in his very learned writings: "No transitional forms between existing species are known; and known varieties either in the vegetable or animal kingdom, whether selected or spontaneous, never go so far as to establish new species." He says further: "*Natura non facit saltum*, *i. e.*, nature makes no leaps in forming new species so far as I am able yet to discover." M. Huxley maintains that Mr. Darwin hampered himself with his "*natura non facit saltum*" The latter, not so cautious, nor so scholarly, as the former, in his advocacy of what is known as the Darwinian theory, said some things of which Mr. Darwin would be ashamed. Mr. Agazzis, as great a scholar as either, and a more common observer, says: "The walls between the genera or species are insurmountable. I claim to be scientific, and to charge me, and those who think as I do, with not being scientific, is unfair, and yet I have never observed a fact or an *argumentum inferentia* (*i. e.*, an inferential argument) that in the least supports the idea that the species are evolved from a lower order as the varieties are formed by hybridization from the species." We therefore infer from all that we know, or from all that others can teach us, that God made the species and relegated to man the privilege in his reasoning powers to aid nature in producing the varieties.

Our classic friend enters the field of aboriginal nature and applies his terms to what he finds. He first discovers a number of fruits pendant or hanging, the seeds of which are enclosed in a kernel or stone, and this in turn is surrounded by a pulpy coriaceous or fibrous pericarp. This pericarp is that part that horticulturists seek to improve. All this species he denominates *Drupes*. The plum, cherry, peach, walnut, etc., belong to this species. Cultivation has taken this hard nurly and unpalatable pericarp and imparted to it bulk, mellowness, succulency and deliciousness. That is the work of the horticulturist.

Again he observes in natures wilds another seed that is enclosed in a capsule, and that these capsules are enclosed by a pericarp without valves, and that this pericarp is fleshy or pulpy. This species he denominates *Pome*, from which word we derive our word pomology. In this fruit it is not the

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seed or capsule we seek, but the pericarp. This he improves from the hard nurly pericarp of the crab apple to the delicious varities of apples that comes to our hand. The cultivation of apples and pears in their great variety belongs to pomological science.

Again, our friend sees another seed imbedded throughout a succulent or pulpy mass of various shapes, but mostly like an old fashioned bee-hive or mould. This he denominates *Berry*. The horticulturalist seeks to improve this pulp, and what delicious flavors he has imparted to it. The blackberry, strawberry, grape, currant, whorteberry and raspberry belong to this species.

Our classic friend again finds a plant whose closely connected floral whorls become succulent and form a fleshy substance. These he names *Sorosis*. And no sisterly society ever entwined about each other in their arms of affection, more closely than the floral whorls of the pine apple and those of its class.

This indefaticable student of nature finds another fruit enclosed in a cavity surrounded by a pulp, and this pulp enclosed by an unvalvular indehiscent covering. These he denominates *Pepo*. The pumpkin, cucumber and melon belong there.

These and other forms in which primitive fruits are found, come to our hand from a beneficent Creator, who said to man in his primitive condition. "Take these primitive fruits, dress them and keep them improve their condition for your own and your fellows good."

In order that this work may be well attended to, specialists are set apart to devote particular attention to this department of science. To you horticulturists is given the important duty of doing God's bidding in this work. And the man who improves the fleshy pulp of a crab apple to the succulency of the pulp of the Baldwin or the Greening is doing God and his follow man as much good as the one who exhorts or prays in a prayer meeting. And the man who studies this subject as he ought, not only gets "near to nature's heart" but he gets near to Him who is the author of nature.

DISCUSSION.

Capt. C. L. Watrous: I think this paper deserves a vote of thanks. (Motion seconded and carried.) At a horticultural exhibit in Boston a specimen of the original apple which tempted "Eve" was shown. It is claimed that fruits originated in the country southeast of the Black sea, or in Persia, near the Caspian Sea, and is the orgin of the apple, which was very small. Some were found by the cave dwellers in Switzerland. Our apples first came from Europe and were not as large as a lady's little finger. This is a specimen of an apple coming from the seed of a wild crab.

President C. G. Patten: To show you we do not wish to be outdone by the Boston Horticultural Society we will show you one which

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grew on the college grounds at Ames. This is an original specimen of the one that tempted "Eve."

Mr. J. W. Clinton: I think the specimen shown so small it was hardly worth while for "Eve" to partake of it, and illustrated by relating an anecdote.

Mr. Underwood: I think "Eve" must have cultivated the apple some before giving it to Adam, in order to form "Adam's Apple."

Capt. C. L. Watrous: I move we adjourn until 10 A. M. Thursday, December 8th.

The motion was seconded and carried.

THURSDAY MORNING.

Called to order by President.

SOIL, LOCATION AND PLANTING ORCHARDS.

BY EDSON GAYLORD.

In examining the programmes of the Iowa and the Northern Iowa Horticultural Societies, it will be seen we have been assigned almost the same identical subjects by each. We see no better way out of this dilemma than to put the two together in one report; and as charity commences first at home, we have thought best to present our mites here at our home society. Should we fail to present these most important subjects assigned us in their true light we shall rely on the charity of members present to add and correct as the conditions may appear to need.

Soils have a very important bearing on the health and productiveness of our fruit trees. We have studied no authors on what we may present you; we have only gleaned along the roadsides of nature's broad highway, as you will readily perceive as we proceed in giving our views on this subject. After examining several hundred orchards in the northwest, scattered over as many miles, we find while much depends on the surface soil much more de-

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pends on the sub-soil. Could we have the selection of the first foot of surface soil or the three feet of sub-soil immediately below, we would choose the latter.

If the surface soil is too wet it can, in most cases, be made dry. If too poor, it can be made rich. If too sandy, it can be mixed with clay. If too heavy, it can be mixed with sand or manure, as the conditions may require. But to materially change the character of the soil below the first foot, except to drain, would be beyond the means of those in ordinary circumstances.

If there is any one kind of soil poorer than all the rest, it is the one composed mainly of sand and gravel, and this resting on an open sub-soil. On such soil we find failures inevitable. These worst of conditions can be changed, however, to a limited extent, first by a cool slope, next by proper mulching, training, and shading the tree from the direct rays of the sun.

The next best soil we find composed of common clay, loam the first foot; the next two feet a yellowish clay, running often into a blue clay after the third foot. This soil is very common in a great portion of the Northwest, and where found to be nearly level we deem it to be very objectionable and can only be made a success by a heavy outlay in artificial drainage. This we consider the most detrimental soil in the way of successful orcharding here, not because it is altogether the worst, but because it extends over such a vast territory. Such soil, when found high and sloping, may be next to the best; and since a great portion of this kind of soil is thus located its evil influence is very much contracted.

Another soil quite common in Northeastern Iowa is found with the first foot of clay or sandy loam, then two feet of soft clay, next a sort of joint clay resting on a few inches of shale, which in turn rests on substantial ledges of limestone.

But there is another soil, better than all others, brought to light and made known by the great disaster of 1884-5. We have examined a number of orchards located on a similar to the one we are about to describe. This oschard presents a remarkably interesting lesson for the student of horticulture at this crisis. This orchard is located on high elevated prairie east of Clear Lake. Was set and grown by H. N. Bushnell, the present owner. His unprecedented success on his chosen location calls for more than a passing notice. It can be truthfully said of this orchard, what we venture cannot be said of any other in Northern Iowa. It escaped unharmed that direful calamity of 1884-5, which made our fruit orchards sickening and discouraging pictures all over this Northwest, blasting the best and brightest hopes of the most practical pomologists we have. The successful growth of this orchard cannot help reflecting both the wisdom and sagacity of its founder. His Early Richmond cherry trees have borne fine crops of cherries since 1884. His varieties of apples that have been bearing since 1884 consist of Duchess, Tetofsky, Haas, Fameuse and Wealthy. He has the Walbridge in healthy condition, the only ones we have found in Northern Iowa; but notwithstanding their healthy condition, they have never, up

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to date, borne any fruit. This orchard has not only passed 1884-5, but has also passed the two extremely dry seasons of 1886 and 1887.

This surface soil of this orchard for fifteen inches deep is composed of dark clay loam, slightly mixed with gravel. The next layer for five feet is composed of a kind of a conglomerated mixture of sand, gravel and heavy clay, mixed and packed together firmly, so much so as to require heavy blows with pick or grub hoe to loosen or remove. This five foot layer of subsoil is evidently stored with such ingredients as are highly beneficial to the growth of trees and fruit.

We have often thought that trees have two kinds of roots; one whose business is to strike out over or near the surface and gather in what vegetable matter is near the surface. While the other was assigned the more arduous duty of penetrating the hard cold subsoils for the many kinds of ingredients that are found by chemical analysis in the wood and fruit.

Mr. Bushnel tells us that in digging a pit near his fruit trees, he was surprised to find their roots penetrating nearly through this five feet of excessively hard subsoil. Immediately below this subsoil is found a few feet resembling common lake shore sand.

It is a well known fact that the roots of trees and plants have an inclination and power to turn toward moisture or fertilized soil. Taking this view of the situation, it is not so much a wonder that we see the small, tiny roots forcing their way deep down into the excessive hard pan. To say the least, it is quite evident that these roots have some specific work to perform in building up the tree and richly developing its fruits. To whatever may be attributed the success of this orchard, it cannot be attributed to the absence of excessive cold, since it occupies one of the bleakest and coldest sites in northern Iowa.

A proper chemical analysis of this soil would undoubtedly prove useful to those engaging in fruit growing in the northwest.

We have examined four other orchards, where we have found very much the same conditions as this. One at Clear Lake, one at, and the other near, Cedar Falls and two near Waverly; each containing nearly all the old varieties thought to be hardy before 1884. The most of these trees in each orchard are nearly as sound as the one at the lake. Nearly every variety have been bearing fair crops of apples since 1884, except in one of the orchards at Cedar Falls, where the trees were set over a sandy subsoil. These trees were dead. In the other, where the trees were shut in by thick timber, they were either dead or injured. In the latter orchard, the subsoil is quite different, and this may account for the greater mortality seemingly caused by the protection. The question in my mind is, whether or not the orchard at Clear Lake would not also have perished had it been as closely protected as the latter was where the trees were mostly ruined.

We found two striking cases of orchard and nursery trees being killed at Nashua, where they were set on good surface soil and a sandy subsoil beneath. What made these cases more striking examples of death caused by sandy subsoil, was the fact that the land lay in strips through the orchards; over these strips or belts of sand the trees were dead, even before

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1884; while previous to 1884 the other portions of these orchards resting on clay subsoil were in fair condition. A portion of each orchard had the same kind of surface soil. We have lately read two articles from the pens of eminent pomologists recommending a high, dry soil for orchards.

We do not object to the term high, but we do to the word dry, unless qualified. We are being convinced every day we investigate this subject, that no soil that will shorten a crop of corn in a dry season is suitable for an orchard. We favor a high location, but prefer a soil that will produce a good crop of grass in an average season. We object to soil where roots go down for moisture and cannot find it. We found very many of our best orchards before 1884 thriving well on high rolling lands with heavy retentive sub-soils; such soils as would in an ordinary season produce a good, full crop of grass. If we have crossed the track of any present, we hope they will not fail to correct us here, as we deem it very important that errors do not go on the records uncorrected, or any language so used that its meaning will have a tendency to mislead those who have studied the subject less, and are eagerly searching our reports for new and better advice. In conclusion of this part of our subject we will add, that whether the professors do or do not correct us, we certainly hope any one present will take full liberty to do so.

Touching the subjects of location and planting, aside from soil, we cannot, for the want of space, do more than to make a few very brief suggestions relative to a few special points most necessary to be considered in this connection.

First, select a high rolling site, a little inclined to be retentive. My choice of slope in order as named is: N.E., N., N.W, S.E., S; and last of all S.W. Mr. Gideon says one acre of the first is worth more than forty of the last, and after much thought, we are half inclined to believe that he is more than half correct; and if we count the gains and the losses on each and strike a balance, we are inclined to think he is as near correct as men generally get. Cultivate your ground thoroughly; then set your trees by digging the holes large enough to straighten the roots out in their natural position. Set your trees from three to seven inches deeper than when in nursery; set them leaning to the sun at half past one; see you point the leading branch in the same direction; stamp the dirt firmly over the roots, except the last two inches on top; leave this loose and nearly level; mulch or continue to cultivate thoroughly and often. Where the roots have been lost, reduce the top to correspond. Go over your trees a few days after setting with sharp knife; remove all branches that appear to be in the position to take the sap that should go to build up the sunny side of the tree over to the N.E. side. In this country an abundance of branches, leaves and sap, on the sunny side of our apple trees is of very great importance while an excess, suffered to remain on the shaded part of the tree, wil surely sooner or later work its destruction. The extent of time necessary to bring such trees to destruction may number fifteen years, but seldom requires more than three after the tree has commenced bearing. Men anxious to grow apples often say to me: I have set and trimmed my trees as

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you have often written, but when I go to look them over three or four years after setting, I find them nearly all making over to the N.E. We say to such, you should go over your trees three or four times every season and clip off all twigs putting out on the N.E. side the tree; do this for five years, and your trees will then have their proper position firmly established. We are then told they do not have the time to bother with them so much. We next ask them (if a farmer) how often he feeds his calves; he replies, twice each day. We reply, better feed calves and let your trees go.

There is one more very important consideration for those to look to who are setting out trees. If your ground has just been thoroughly worked you need only dig your hole just large enough to contain the roots in their natural position, but in these times, when so many are resetting trees to fill vacancies they should thoroughly understand that it is almost or quite necessary to dig holes for setting trees as large as four or five feet across. Many have set their trees the past season where the ground has not been plowed for two and three years, only diging holes just large enough to receive the roots. Such setting has resulted in absolute failure. Many intelligent men fail to catch on to the principle in such a small hole dug in hard soil, the moisture will soon evaporate like water out of a tub, the capilary attraction being broken between the loose earth and the hard banks that surrounds the hole the tree will be unable to draw either moisture or nourishment aside from what little there may be in the small hole. Then let no one forget, or overlook the importance of diging broad holes where trees are to be set in hard soil; and still farther, by all means fail not to keep such, set trees thoroughly mulched at least a foot beyond the outside of the space dug to set the tree.

REPORT FROM WORTH COUNTY.

BY J. M SLOSSON, NORTHWOOD.

Another unfavorable season has given more evidence that there is no known variety of apple of value for fruit that can thrive in our climate.

I will give my experience with an experimental lot of apple trees, as it is a fair average of success in planting the past two years.

A year ago last spring I planted about thirty varieties of Russians, and a dozen of crab and standard varieties. Some of them were from the Iowa Agricultural College. Some from A. W. Sias of Rochester, Minnesota, and a part from the President of this Society, Mr. C. G. Patten of Charles City.

Some of these Mr. Patten called among the best in his experience, and Mr. Sias recommended his as among the hardiest in Minnesota. In the list

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were Hibernal, Antonovka, Yellow Anis and several others of the Anis family.

Every tree started, but the dry weather of summer checked growth, followed by growing weather in the fall, and very severe early winter. Most of them survived this, but the dry weather of the past summer was too much for the largest part of them. Some Duchess grafts set about the same time have stood as well as any.

About a thousand Red cedar seedlings from six to eighteen inches high, were set in nursery row between two rows of apple trees. With the same care except a partial covering of prairie hay when first set over ninety per cent of the cedars are in good condition.

It should perhaps be stated that the cedar seedlings were pulled by a friend who selected more stocky plants than those generally sold.

Examples of apparent success in raising apples might be given. A gentleman a few miles north from here has some Wealthy trees on black prairie soil that have been growing right along these bad years and this year bore a fine crop.

Some Duchess trees have been bearing several years and are yet in good condition. Some are dead and many others show the effect of too hard conditions.

Blight takes the crabs. The best of them live to bear several crops and an occasional tree seems to adapt itself to heat and cold, flood and drouth. Last spring I grafted some bearing crab trees with Wealthy. Some of the work was done on last year's growth so that stock and scion were nearly the same size and a part on limbs about half an inch in diameter. Less than a fourth of the tops were cut at all, and by this method what was cut were cut only lightly, but they have blighted badly, grafts and all.

REPORT FROM HUMBOLDT COUNTY.

BY ED. CONNERS, HUMBOLDT.

The season just closed has been of inconsequence, and in some respects for some of the old varieties of apples and crabs gave a fine showing of fruit. You must not infer from this that we have marketed thousands of bushels of apples, nor that our cellars are laden with delicious fruit; far from it, but we are thankful for small favors and large ones in proportion. The varieties that have retained their vitality and have borne a good crop are Duchess, Tetofsky, Whitney No. 20 and Wealthy, while the Walbridge, Gros Pomier, Tallman Sweet and many of other old varieties have borne some fruit, but

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for the last time. I think that the Duchess and Whitney should be more largely planted, for they will make a good stock to top-work when we shall be sure that we have found something for a winter apple that will endure our climate.

Plums were a light crop, but we find the De Soto at the head of the list.

Cherries, there were none to speak of, for the reason that about all of the trees that were large enough to bear have died out from the past severe winters. The varieties that were planted were Early Richmond and Morello. The latter have endured our climate the best.

Grapes were the largest crop ever raised in the county. The Concord seems to take the lead, while the Warden I think will be a very desirable grape. Moore's Early gave a good crop and should be more largely planted, for the reason that it is early and the fruit can be put upon the market before Concord and other late varieties, bringing a much better price. Janesville should not be lost sight of, for it is an ironclad and a good bearer.

The strawberry crop was shortened up by the drouth. The varieties giving the best satisfaction were Crescent, Charles Downing, Manchester and Red Jacket, the latter standing the dry weather the best.

Currants were nearly a failure, from what cause I cannot say. The bushes were thrifty and made a good growth.

We have sustained considerable loss on evergreens from the continuous dry weather. The Cedar, White Pine, Scotch Pine and Austrian Pine went through in good shape, while the Norway Spruce, Balsam Fir, Black Spruce and Arbor Vitæ to a great degree have failed.

DISCUSSION.

B. F. Ferris: I am surprised that Mr. Conners, who is said to be a practical man, should report balsam and spruce a failure. I regard them about as hardy as the pines.

Mr. President: I do not think the Wealthy is hardy enough for a stock for top-working. We have the Virginia Crab, which has often been confounded with Hues' Virginia. The Virginia is a hardy and good stock. It makes a large growth. Mr. Fluke of Davenport says his trees are three feet in diameter. It is a long lived tree and vigorous and good for top-working. They are very smooth trees and give general satisfaction. The Wealthy and other stocks may be grafted upon it with success.

Mr. Gideon: The Wealthy apple comes through all winters in Nebraska all right. We think they are the best stock to graft upon in Minnesota.

S. W. Ferris: It often happens that the Wealthy is in better condition in Minnesota than in Iowa. It often sun scalds. Yet I esteem it next to the Duchess in the old list. It is not as successful with

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me as Virginico Winter, which is an immense grower. The Duchess is not always a good tree to top-work, as it matures too quick and does not give the grafted top time to ripen its wood before ceasing to supply sap.

Mr. Gaylord: I want to know more about the Virginia Crab. From all I can learn all knowledge and research confirms the favorable remarks just made. Mr. ———— has an orchard of 16 years standing. He compares the Virginia to Duchess and Transcendent. It does not blight and all stocks seem to take kindly to it. I got 60 trees and grafted them and they are all doing fine.

Mr. Speer: Will Mr. Ferris give a reason why the Duchess does not make a good stock for to-working? The Fameuse wants 25 days more to mature its wood than Duchess. Yet when the supply of sap is stopped the Fameuse leaf ripens and the maturity of wood naturally follows.

S. W. Ferris: My conclusions are drawn from experience. I graft the Duchess upon a seedling, and the Duchess wood will mature in 90 days. The Tetofsky drops its leaf before frost. If grafted on a winter apple it continues to do so. The stock in such cases does not control the scion. Again, a winter apple grafted upon either of these will hold its leaf longer than its stocks. I like Virginia best for a stock and it is suited to a wide diversity of condition. It thrives even on the sands of Nebraska.

RUSSIAN APPLES.

BY J. B. MITCHELL, CRESCO.

The subject assigned me has of late received a great deal of attention through our horticultural journals, and is one of much interest to a large portion of our country at the present time.

As the severity of our winters differ so materially from north to south, and because of the well-known fact that fruit trees that may do well in the warmer portion of our country, may and do fail in the other or colder portion, any recommendation or condemnation of the Russian apples (as well as of any other fruit) for the whole country or without that portion being given for which they are so recommended or condemned is at fault.

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The Russians having originated in a cold climate, and my experience with them having been in the trying cold northwest, I shall discuss their merits for northern Iowa and the northwest, north of latitude forty-three degrees.

In view of their sad experience with apples in northern Iowa the people of our bleak prairies do not care how well the Russian apples will keep in Georgia or how they will succeed in New Jersey or even in New York.

I have probably given many of these varieties a longer and by my northern location a severer test than any other man in Iowa, as I commenced with them in 1873 and have grown over a hundred varieties. Among these I have found a goodly number of untold value to the Northwest. In my nursery there are at least twenty varieties of Russian trees of three years growth that have made a good growth this year from the terminal bud with not one tree in one hundred failing, while not one tree in one hundred of a block of two thousand Duchess of same age and on adjoining ground started from the terminal bud; but on the contrary lost from one to three inches of last year's growth by last winter's cold. This at least speaks eloquently for the hardiness of these varieties, as the Duchess almost invariably bear a good crop of fruit.

I would not have any one understand that I consider this test alone sufficient, for I have frequently noticed that some variety would come through a certain winter in better condition than others, while the reverse would be true some other winter; but these Russians have always come through in as good or better condition than the Duchess, and this, I think, is sufficient to warrant their recommendation.

As one test winter succeeds another I become more convinced of their value for northern planters and that we shall soon see our homes surrounded with orchards of comparatively healthy trees, bearing beautiful and good fruits, instead of dead trees and rotten stubs, relics of our past experience with the American sorts.

Mr. Watrous, in his articles in the "Prairie Farmer" states the fact that the place from whence the Russians were imported is in a latitude 770 mile north of St. Paul, Minnesota, and 1015 miles north of Des Moines Anyone who has followed his articles through in that paper and noted the description there given of the wind-swept, snow-drifted and ice-bound country of Russia and the rigor of its climate, can but come to the conclusion that it is much worse than ours, and that trees that have the inherant vitality to endure the Russian winters certainly ought not to winter kill in Iowa.

But throwing this evidence aside, it would seem that their behavior here during the ten or twenty years they have been tried, as attested by those who have had the most experience with them, ought to be sufficiently convincing. We have further and longer evidence in favor of this race of trees in the superior vitality of the Duchess and Tetofsky over our native sorts.

Some may urge that I am putting too much stress on hardiness, that keeping quality of the fruit is just as essential. In fact the Russians have been denounced because of the fear that there will be no late winter keepers.

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among them. Winter apples are desirable; so also are summer and late fall or early winter, and certainly much better than none.

We can grow no apples unless we can first grow a tree to a bearing age. To the many who have failed in this after long years of trial it becomes more of a question of any apples at all other than crab apples, than it does of those that will keep until spring. But, however, there are among these, apples of good quality that will keep into December at least, and I believe some that are winter apples here and north. But supposing there were no late keepers among them, can any sage tell us of a winter apple of any other variety, the tree of which will live in the northwest north of latitude 48 degrees long enough, in healthy condition, to produce fruit?

Of course, in the more favored southern localities the winter apple question may well be agitated. But I am writing from a point under different circumstances, and object to the wholesale condemning of varieties of so much apparent moment to the people of that portion of Iowa which furnished the largest apple on exhibition at her State fair aud that a Russian apple.

Still, some think we had better be shy of them and go to work and grow possible better trees and apples from seedlings. While I have great hopes of results in the future from this course of procedure from what myself and others have already accomplished in this time, yet I believe in making use of present good while waiting for the possible better.

MY LAST SHOT AT AMERICAN APPLES, PEARS AND CHERRIES.

BY R. P. SPEER, CEDAR FALLS.

Some of us have labored hard and faithfully for more than twenty years to advance the interests of Iowa fruit growers, but now they refuse to allow us even thanks for our work. Instead of giving us thanks they curse us for deceiving them by sending out long lists of what we called "iron clad" fruits, which have proved untrustworthy. I imagine that I can hear now the echos of the loud and positive expressions that were used year after year at the meetings of the Iowa State Horticultural Society: "We don't want any more summer or fall varieties of the apple for the central or southern districts. All that we do need is a few more good winter apples." If there is a genuine American apple, or one which was produced from seed in southern Europe, for any season of the year, which has proved hardy on any of the prairies of Iowa, I hope that our attention will be called to it. All of the old and favorite pears and cherries, have proved as tender in Iowa

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as the worthless American apples. The Siberian crabs and hybrid apples, which were very promising a few years ago, have also proved worthless south of the 42d parallel, except the Whitney, which has scarcely any of the crab characteristics. Then, are we at the end of the rope and shall we surrender to a very rigorous climate?

Or shall we go on with the work and experiment for twenty years more with the American trash which has nearly bankrupted some of us? Or shall we try the Russian fruits, which have done well for hundreds of years where the climate is much more severe in every respect than ours? "But hold on," some of my friends will say, "that will not do, as there are no good keepers among the Russian apples" Here is the straw which broke the camel's back. If we had even one winter apple as good as the miserable, flavorless Willowtwig, we might stop to consider such an objection; but we do not have it. We are poorer than milk after passing through a centrifugal machine. Perhaps some one may suggest that Captain Speer has Russian apple trees to sell, and that he is playing a bluff game. To such a suggestion I would reply, that I will give any man who has faith in American apples a chance to make some money. I will enter into a contract with him to dig and deliver at either of the Cedar Falls depots, next spring, from theee to five car-loads of Walbridge, Fameuse, Pewaukee, Plumb's Cider, Haas and Allen's Choice for $35.00 per thousand. The trees shall be three and four years old and from five to seven feet high. Or I will sell them as they stand in the nursery for $25.00 per thousand. Within a very short time I have lost more than a hundred thousand apple trees in nursery rows by winter-killing.

In 1884 I had a bearing orchard of 1,500 trees of such kinds as I have named above, which I valued highly. I had picked from it 1,100 bushels of apples in one season. It stood on as good orchard soil as can be found in the eastern half of Iowa. I had petted it and gave it the very best of attention from the time that the trees were planted, but the winter of 1884-5 and the severe drouths of 1886-7 wiped it out. Are any of you green enough to believe that I will plant such trees again? I propose to propagate and plant fruit trees from the interior of Russia, hereafter, and will give some of my reasons for having faith in them.

Very many kinds of apples, cherries and pears have been grown successfully for hundreds of years on the great prairies east and southeast of Moscow. From the reports of such noted pomologists as Leo Weltz of Ohio, Charles Gibb of Canada, and Drs. Shroeder and Regel of Russia, we are informed that Central Russia is the fruit garden of that great country. There, apples and cherries are grown in such immense quantities that they are of but little value, and are shipped to the large cities and distributed over Russia, Norway, Sweden, Denmark; and even Germany receives a large supply.

On the bleak steppes, where this great fruit garden is situated, the winters are colder and the spring seasons are as changeable as in Iowa. There also the summers are as hot and the atmosphere is dryer than here. When we come to inquire why apples, cherries, etc., can be grown successfully there

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and not in Iowa, we find that there are remarkable differences between the characteristics of the hardy Russian fruits and ours. They have thick leaves, which enables them to thrive during times of severe heat and drouth, which would kill fruit trees like ours, which are adapted to cooler and moister climates. There, as is the case here, the surrounding conditions are very favorable to the rapid evaporation of the liquid matter which trees contain; but to prevent injuries from this cause, nature has given the Russian fruit trees wood, bark and bud scales of much finer texture than ours. She also enables them to store up more starch for future use towards the close of the growing seasons, than is ever found in any of our tender American fruit trees. They ripen their wood early in the fall and are ready for winter, while our trees go into winter generally in an unripe condition. The blossoms of the hardy Russian trees have much shorter and more stalky pistils and stamens and larger pollen grains than the blossoms of our tender trees. Also, trees which are adapted to the interior of Russia are not inclined to lean towards the northeast or bark scald like ours; nor are they inclined to start growth in the spring when the temperature of the atmosphere is lower than is necessary to start growth in the Duchess of Oldenburg. But we should be careful not to be deceived by the presence of one or two of the characteristics which I have named, in new trees or untested seedlings, as the thick leaves of trees do not indicate more than that they are adapted to hot and dry summers like ours. When a tree lacks any of the characteristics which I have named, it is not adapted to the trying climatic conditions which are common in Iowa. I have been told that such theories are very nice; that new brooms always sweep clean, but that by and by, after the new Russian trees shall have produced a few crops of fruit they will die, like the Fameuse and other trees in our old orchards. But do we not have the behavior of the Duchess of Oldenburg, Tetofsky and Alexander apples and the Wragg and Minnesota Ostheim cherries for many years, as evidence that it will be safe to trust other fruits from central Russia? On my own grounds the Silken Leaf, Thaler, Repka Kislaja, Noble Red Streak and a half dozen other varieties of apples, have proved as hardy as the Duchess of Oldenburg for thirteen years, while more than 200 trees of such varieties as Walbridge, Fameuse Plumb's Cider, etc , which were planted in the same orchard and at the same time, are dead. I will also cite you to the bearing orchard of nearly one hundred kinds of Russian apples belonging to Mr. Tuttle of Baraboo, Wisconsin, which was green and healthy during the terrible drouth of last summer, while all of the orchards of American trees around it looked as though fire had ran through them. I could also refer you to other Russian orchards and to scores of thousands of Russian fruit trees in western nurseries which came through the winter of 1884-5 in good condition, while millions of the old favorites were fatally injured. It has been urged against the Russian apples that they have not proved sufficiently productive on our prairie soils. With me they have not proved very productive when top-worked on the Duchess of Oldenburg and Haas; but fully as productive as American apples, when root-grafted. Here is a question which should not be allowed to pass without careful consideration. For years we have

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been recommending the top working of desirable, half-hardy apples upon the Duchess and Haas; but as far as my experience goes such trees have proven very unfruitful generally. I have about fifty large Haas trees top-worked eight years ago with Pewaukee, which have not produced a bushel of Pewaukee apples since they were grafted. The bodies of most of these trees are now seriously injured by climatic influences. I have also about fifty Duchess trees, which were top-worked eight years ago with Iowa Blush, Dyer, Willow Twig, Wealthy and Grimes' Golden, but none of the varieties which I have just named have produced more than half a dozen apples in any year since they were grafted. A neighbor of mine top-grafted ten Haas trees seven years ago with Ben Davis, which have proved as nearly barren as my top-worked Haas.

James Hearst, who resides about five miles from Cedar Falls, top-grafted thirty young bearing Duchess trees seven years ago with Grimes' Golden, but from all of them he has not picked in any one year more than two bushels of apples. In 1878 and 1879 Prof. Budd top-worked one thousand Haas and some Duchess trees on the Iowa Agricultural College farm, with Russian apples (principally from the agricultural department) and about forty of the most promising American apples. They are now large enough to bear two bushels of apples per tree in a single season, but thus far all of them have proven nearly barren, except the Longfield, Silken Leaf and Cross apples. Now, when we ponder a moment over the fact that nearly every Iowa fruit grower grafted his first Russian apple scions on the tops of Duchess or Haas trees, it will not seem strange that some of the Russian apples appear to be unproductive. It has also been urged against the Russian apples that they are coarse and of inferior quality. In most instances, people have formed opinions as to their quality by eating the fruit of the varieties which were imported by the Department of Agriculture from St. Petersburg; but Dr. Regel, Dr. Arnold, Dr. Shroeder, and other distinguished Russian pomologists, have said positively that the best desert apples, cherries, etc., are not grown in the vicinity of St. Petersburg, but in the hotter and drier air of Central Russia. Is it probable that Dr. Shroeder did not know what he was talking about when he reported that the Moscow varieties were good desert apples, which he sent to Prof. Budd, marked Nos. 6, 20, 21, 28, 30, 31, etc ? Have we any reason to doubt the words or judgment of the ripe scholars and skillful American fruit growers, Charles Gibb and Leo Weltz, who have traveled thousands of miles over Russia for the purpose of studying her fruits, when they say that many of the apples grown in the interior of Russia are of fine texture and good for desert use? Of the few Russian apples which I have fruited, the Thaler, Noble Red Streak, Repka Kislaja and Beautiful Arcade have proved to be apples of excellent quality. Our best physical geographies show that the average summer heat of Central Iowa is about the same as the average summer heat of the best fruit districts of Russia, where many kinds of good winter apples have been grown successfully for hundreds of years. We will admit that the winters are colder there than in Iowa; but as apples grow and mature there as well as here, during the summer seasons; I cannot see why the

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difference between Central Russia and Iowa winters should affect the keeping qualities of apples or other fruits. It may be that choice winter apples from the interior of Russia will not keep longer than the Jonathan or Grimes' Golden, when grown in Iowa. Indeed, I believe that it is very doubtful whether a real good, long-keeping apple can be grown in Iowa or not. I have never seen a single apple which was grown in Iowa on a Janiton, Ben Davis, Winesap, English Golden Russet or other long-keeping varieties of trees, which could be called good when compared with apples of the same varieties that were grown in Missouri where the summers are longer. But if we can only find good, hardy Russian apples, which will keep as long as the Jonathan, will we not be much better off than to have no winter apples at all. As Russia is a very great country, where there is almost as great a diversity of climatic conditions as in the United States, I am confident that hundreds of kinds of apples, which are valued highly there, would prove worthless here. Some of them from the far north would endure extreme degrees of cold, but they would blight here and be liable to serious injuries from the effects of our very changeable spring seasons. Others that are adapted to the moist atmosphere of Western Russia near the Baltic Sea, could not endure any dry atmosphere and very hot summer. And if we should import fruit trees from the vicinity of the Black Sea, in Southern Russia, it is very probable that they would prove more tender here than trees that are adapted to the climate of our Atlantic States, which we discarded long ago. All of our selections of fruits should be made from that part of the steppes or prairies east of Moscow, where the climate and soils resemble ours most.

Last spring I planted four trees of each of one hundred kinds of the most promising Russian apples in an experimental orchard. I also planted a small experimental orchard of Russian cherries. I intend to enlarge these orchards hereafter by continuing to plant other promising varieties from year to year. If others will help me by planting experimental orchards, I am very confident that apples and cherries will be as plentiful and cheap before long in Iowa as they are in the great fruit gardens of Russia. I have strong faith that we can produce very valuable fruit trees for Iowa by cross-fertilizing the blossoms of the hardiest Russian trees with the pollen of our best American varieties, and I shall do my full share of such work. But if we should depend exclusively upon the latter method of procuring hardy apples and cherries for Iowa, the present generation at least must do without such fruits.

DISCUSSION.

W. A. Reeves: I have been much interested in the Russian apple. I am intersted in growing apples for family use. I have had apples the year round; but this year I am already out. Prof. Budd has said we would have apples the year round from these Russians. I wish we might; but I have been watching these horticultural meetings for

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something that will give satisfaction, and I want to see the winter fruit before I shall believe it or plant any more of the trees. I hope the time may come when we shall again have apples the year round. I am ready for anything that will give us apples for winter, but until they are found I am done planting.

Mr. Wells: Mr. Reeves must persist if he would succeed. He must stock up and experiment and try to raise the standard and extend the list of our fruits. He must not be like the old woman who did not want her boy to go near the water until he learned to swim.

Mr. Clinton: The paper just read is a very able one. I was born in Canada. People there were hostile to fruit raising, thinking it could not be grown there; but that country has developed wonderfully. It was difficult at first, and people objected to setting trees; but since the country has been developed, it has become one of the best fruit countries. We must experiment and retain those adapted to our country in order to obtain what we desire.

Mr. Thompson: I do not expect to give any strength to this argument. We have the American seedlings and we must keep them and keep experimenting with them. We have some which keep till spring. If we cannot have a whole loaf we must be content with half a loaf. It may take us two or three hundred years to get what we want and we have to top off on Russian apples in our old age after all.

Mr. Gideon: I live in a worse country for fruit than northern Iowa. I would not reject trees because they failed in years past. Such winters as we have had rently may not recur in ten years. Trees which live and bear ten years are a paying investment. Russians blight as badly as any trees. Some of them are well worthy of cultivation. Mr. Moulton's trees were mostly Russians grafted on Transcendents. Three years ago only three survived out of 230 numbers. I had a collection from Moulton, from Tuttle and from Washington; also from Prof. Budd. All were discolored and some killed to the ground. All from Prof. Budd colored last winter, though it was only an ordinary winter.

Mr. Thompson: What became of those of your seedlings which bore?

Mr. Gideon: Some were killed by blight, some by the cold. Three years ago the trees of Minnesota went into winter with the sap in the top, and of course all were injured.

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Mr. Watrous: While acknowledging the force of the argument in favor of the Russians we must not forget that there are two sides to the question, nor that those who distrust the claims made for these strange and little known fruits have their reasons for being conservative. Books on climatology show us that the climates of western Europe and the western coast of North America are duplicates, while the climate of the eastern shore of one continent differs markedly from that on the western coast of the same, or of the other corresponding continent. A letter from a friend on our western coast in the latitude of St. Paul says: city water pipes are placed but one foot deep to be beyond frost. In Iowa we must place them four feet deep; but in Western Europe again in our latitude, one foot is deep enough. The similarities of climate on the western coasts of continents are caused by westerly winds from warm oceans in winter carrying heat and moisture, so that those climates, compared with ours in Iowa, is like a cool and moist green house, without our sudden and great changes. The influence of the warm gulf stream of the Atlantic is felt over Europe in winter as far as Russia, producing immense bodies of snow and a moister air. Trees will endure great cold if they have also abundance of snow and a moist air. After passing through one of our dry winters most Russian apple trees are unable to endure the necessary pruning in nursery without turning black at the base of of the branch pruned off. This betrays a weakness under changed condition. Again, all these Russians are moved southwards at the least about seven hundred miles, to reach the latitude of Centra Iowa. Our seasons open much earlier in the spring than the seasons at their home. Here they complete their growth, mature their fruit and make ready for winter according to their habits acquired there; hence, apples that are winter keepers in latitudes 52°, are summer or autumn aples in latitude 42°. Trees cannot adapt themselves to changed conditions as well as men; hence we may be certain of many disappointments when we expect these exiled fruils and plants to do for us what they did in Russia. No amount of talk can settle these questions. When we have the fruit in our houses and in our cellars in winter, we shall know whether they keep like our own winter apples, but nothing less than that should be offered as proof. Actual tests and years of trial will be the only certain evidence of the value of Russian fruits.

This is a great subject and we must consider that there are two sides to it. All the controversy that has occured and all that may

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follow, will amount to nothing. All our talk about similarity, of environment and isothermal lines will not settle the question. It can not be settled by words, time only can tell the story. We may and should experiment, but we shall never *know* until we hold the apples in our hands. We shall never know the truth until we have the actual test, and it will take us ten years.

We must select from the hardiest Americans and the hardiest Russians and determine which are the best keepers. We have on exhibition many American seedlings. Mr. Mitchell has three Russian varieties here in a poor state. They are all that are shown of the Russians. The latest of these Russian apples are ripe in September, so far as I have observed them.

Our importations are from points north of 51, 52 and 53 paralells. Central Iowa is in 41, 42 and 43; ten degrees of latitude difference. Can we hope to get apples 700 miles north of us, bring them here and find them winter apples.

Whatever our theories, actual experience alone can decide. It is the only test of value to us. In Rochester, N. Y., they will not keep, and that is better air for keeping apples than we have here. Let us try all of them, but try them experimentally; a few of each. Leo Weltz has been over to Rnssia. He found 40 or 50 varities which he liked. Prof. Budd has 40 or 50 varities, in latitude 42 degrees, and three or four hundred which will not do well here.

Let us plant them testingly; let horticultural societies go cautiously to work, and advise very conservatively. Let us not have the responsibility of failures fall upon this society, because of its advise. I ask, should we accept these strangers with all confidence, or with caution?

I propose to go slow and to advise others the same. I ask and demand that men who want to give a word of warning, be allowed to do so, and not be accused of impugning the actions, advice and motives of others. Climate changes both trees and fruits, and they have to adapt themselves to new conditions and surroundings. When we tell about new varieties, we must tell all we knows about them. Central Russia is marked green to indicate timber. Central Iowa was never so marked. In Washington Territory and England, water pipes are only covered one foot, while here they must be buried four feet.

Mr. Speer: What is the difference in the summer heat of Des Moines and Central Russia? The isothermal lines pass through

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Orel, Bogdanoff, Des Moines and then away north to the mountains.

Mr. Watrous: Our apples ripen early because they start early in the spring.

Mr. Speer: When I talk upon this subject I do it in all kindness. Mr. Watrous has dwelt upon the snows and heat of Russia. It does not make any difference. If they can endure the climate of from 45 to 48 here we do not care how cold or hot it is there. If they can stand the winter and summer climate of Des Moines, we want them. Des Moines is much such a climate as the parts of Russia from which some of these apples come. Russia is a vast country and has all stages of heat and cold.. If the average summer heat is the same as Des Moines, and they are winter apples there, that should be something of a guide for us. Of course we must consider all the surrounding conditions.

Mr. President: Let us make our remarks as brief and pointed as possible and confine ourselves mainly to facts.

Jno. C. Ferris: Facts are what we want and I have a few to offer in evidence. I will reply to the question of Captain Watrous: "Shall we accept the Russian with all confidence or with caution?" that I choose and advise the latter. Yet we need not wait ten years, nor need we take the experience of Des Moines and the south, while evidence is abundant in the north. We know that the Russians are a hardy race and they are our hope for present orchards. What else have we of value? Take the Duchess and Tetofsky from our list and what have we left. Is it reasonable to suppose that these two Russians are the only valuable ones we are to find? Leo Weltz says there are forty which satisfy him and he lives in Ohio where good apples are abundant. The President of the Ohio State Horticultural Society is evidently opposing Mr. Weltz, yet he says: "There are some excellent Russian apples, but they may be counted on the fingers." If we can count excellent Russian apples to correspond with the fingers of one hand we will have achieved a triumph and we will rejoice. It is with us a question of apples or no apples, yet we are not hopeless of winter apples among the Russians. Prof. Budd says all these listed as winter apples in central and southern Russia by Dr. Schroder have proven winter north of the 42nd parallel. Dr. Schroder marks twenty-five of these winter, nine of which are hardy, eight medium and eight tender. As to quality he marks twenty of them table. Now a word about change of climate effect-

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ing a radical change in quality of fruit. W. J. Green, of Experimental Station, Columbus, Ohio, says: "Varieties possess inherent characteristics that are not greatly modified by peculiarities of soil and climate." If this were true there would be no such thing as variety." He proceeds to demonstrate this very clearly and forcibly. I receive many words of praise for the Russians in my correspondence. Silas Goss, of Border Plains, writes that he has a number that he values highly. Mr. Goss also speaks well of two or three of Mr. Gideons hybrids. Mr. Christian Stenman, an honest experimenter of Mapleton, writes that only the Russians proved dorment in the recent cold wave which visited his nursery. Mr. Watrous has treated this question fairly and temperately here, and his position on this question is better understood. Our venerable friend Gideon whom we are pround to have with us, says there are some Russians proving good at Excelsior, Minnesota. We can and will get something good from the Russian list. The Longfield is a winter apple and it is excellent. I heard captain praise it at the College farm.

Mr. Underwood: I have kept the Longfield apple until the 20th of January. I have had good crops the past three years. I like the old proverb, "prove all things, and hold fast to that which is good." We want to raise apples for ourselves. We want to come into possession of them by our own genius, and we have the exemplification of such possibilities on the table—the work of a woman from the east. Let us gather all the information we can, and sift out the useful and practicable.

S. W. Ferris: This discussion has drifted too far away. We want something right here in this climate that will stand the test. Mr. Mitchell showed me an apple which he has fruited seven or eight years, No. 979. It has stood where Duchess and Tetofsky froze to the ground. I visited Capt. Speer's orchard when it was a total wreck, yet he has some of the Russian varieties which stood well. He has had a crop for three years. I think the people do not understand Capt. Watrous in this discussion.

E. M. Reeves: I have experimented with the Russians. I have two varieties, No. 240 (Reambent) and No. 262 (Charlamoff), which are hardier than Duchess. I have forty varieties on my farm. I obtained 240 and 262 from Mr. Patten. I obtained twenty-eight varieties from Prof. Budd.

J. B. Mitchell: I have twenty varieties which are better than Charlamoff. I have been cultivating No. 41. It is a good keeper.

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No. 277 has taken the premium at two county fairs as an early winter apple. Prolific, No. 246, is a nice apple. I took three to the State Fair, and they are good now.

Mr. Speer: I want to know what is regarded as a winter apple. Show us your winter apples. You have not a single winter apple that is adapted to the black soil of Iowa. No, nor any summer, fall or winter apple except the Russians. What do you mean by winter apples? I have kept the Fameuse until February. I have eaten the Haas in January, and the Willow in March. Yet they often fail to keep because of drouth or other climatic conditions. With me it is a question of any apples at all, or anything but the Duchess and Tetofsky. Men who come to buy trees of me always want Duchess. They ask for that every time. I know some Russians will keep. I came here to help decide this question, and I am willing to stay two or three days if necessary.

Mr. Thompson: I have no encouragement for croakers, but want to say an encouraging word for that paper. The way to get rid of the croakers is to first get rid of the humbugs. The farmers have been so completely humbugged and duped by agents that it is no wonder they croak. I went with an agent to see a German, and the German drove us both out of the field because the agent laughed when he complained that a minister had cheated him. This Society ought to endorse a reliable list, that people may know with whom to deal. We should also publish the frauds.

Mr. Gideon, replying to a question, says he has never sold the right to the Peter apple tree or scions.

REPORT FROM GRUNDY COUNTY.

BY O. A. BARDAHL, GRUNDY CENTER.

Mr. President and members of Northern Iowa Horticultural Society:

The only fruit we did grow in Grundy this year was grapes, raspberries and a few apples.

Contrary to our former belief that raspberries do best in as hady position, and that berries drying upon the vines is caused by the heat was plainly proven this year to be false.

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Never in the history of our county did we have such a continual heat and never did we have a better crop of raspberries.

Concord grapes bore a large crop where vines were properly cared for.

Strawberries dried upon the vines. Of one acre in bearing I did not get a fair specimen.

The only varieties of apples that bore in our county was the Oldenburg, the Cross and the Thompson seedlings.

The true Cross apple grows on a good tree, which bears a large and beautiful apple of good quality, which keeps into January I think. I have had many inquiries like this: "Which of the Thompson's Seedlings do you consider the most valuable?" I can only judge the value from trees growing on their own roots, and this warrants me to say that about four varieties which are to my mind of same value, and taking quality of fruit and keeping into consideration Nos. 28 and 153 are probably the two best varieties of them all.

Now what are we going to do for apple trees suited to our Northern District? The demand for that kind of fruit is on the increase every year. Not less than six car loads of apples were shipped into our little burg last fall, or about one thousand barrels, representing a cash value of about three thousand dollars. And our apple trees where are they? They are dead.

It is certainly a wide field, open for some one who knows what to plant; but it is no use to try the old varieties, and the stock on hand of any new varieties are not yet sufficient for the demand from our district.

It is some varieties of the Russians which I have hope for, but it is a singular fact that as soon as a Russian tree does prove itself of some value in some respect, it at once gets out of the market and can no longer be gotten.

The progress of horticulture to-day is hindered by the tendency of drifting our mind in the direction of hypothesis and and abstract theory. The fundamental scope of hortiulture should be to plant hardy and suitable trees and shrubs, suited to our climate, and care for them. We should not spend our valuable time in unproven theories of the present, as well as the unfounded dogmas of the past.

I wish your Society a pleasant and profitable meeting.

REPORT OF FLOYD COUNTY.

Apples, except Duchess and crabs remarkably scarce. Excessive drouth has finished nearly all our bearing trees except Duchess, Tetofsky and Whitneys; these generally sound. The Wealthy occasionally found in fair condition. One Famuse tree bearing fairly. Some hardy trees top-worked with

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Wealthy, bearing fairly. One Fall Orange top-worked on crabs bore fruit. The Wolf River top-worked on crabs grow fairly.

Grapes a fair crop, but few grown.

Plums generally scarce; some varieties of natives bearing well. The Miner occasionally bearing some. Young trees newly set generally died, mainly from neglect to cultivate and mulch properly.

Blackberries though mulched heavy, shriveled up and perished on the bushes.

Strawberries a medium crop. Raspberries a fair crop.

Evergreens have passed over the excessive drouth much better than many anticipated. Trees properly heeled in cellar or root houses have grown well where well cultivated.

REPORT BY GEO. RAMBACH.

CEDAR FALLS.

Mr. President—I shall not attempt to say anything about the oft told story of dead fruit trees and the cause of the destruction. From that you can see that there is but little to report.

The Duchess and Tetofsky had a full crop, but they were worthless. Those Russians, I have not had long enough to say anything about the fruit, but from what I can see I am satisfied that most of them are hardy enough for this country.

Of grapes we had a full crop. Of Concord and Worden, and more of fine quality, where they were not summer-pruned, and otherwise properly cared for, I notice where they were summer-pruned they did not ripen as early, and came into market when those not summer-pruned were about gone. I notice summer-pruned vines do not ripen the wood as early, and are liable to lose buds already formed for the next year's crop. The result is a light crop the following year. I would recommend the Moores' Early for family use, as it is a good grape, and prolongs the season, but for market it does not bear enough for me, to make it of any special value. I have tried a good many of the Rogers' hybred; have had them for fifteen years. None have done as well for me as the No. 19; that has always given me a fair return. They want some winter protection, and should be planted in alternate rows with the Concord and Worden. What I have seen of the white grapes I don't think they will give satisfaction for extensive planting. Cherries an entire failure. Plums one-seventh of a crop. Strawberries one-fifth crop. Raspberries dried on the canes before they were ripe, except the Victor; they seemed to mature most of their fruit. Currants also dried on the

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bush before they were ripe. I would advise the Victoria and Red Dutch for general planting. To raise currants from the cuttings, plant in the fall and mulch to keep frost from heaving, and success is certain.

REPORT FROM CERRO GORDO COUNTY.

BY NELSON HANSON, CLEAR LAKE.

The past season has been a discouraging one for the horticulturist in Cerro Gordo county.

We had very little rain during the summer and fall, and where the ground was unprotected by a good covering of snow, trees and vines were badly injured. We have lost some of the finest evergreens in the country. Many Balsam firs, Norway spruce, that had been growing for ten or twelve years, and were twenty to thirty feet high, looking perfectly healthy one year ago, and now dead.

We had a good prospect of an abundance of apples, that is, we had plenty of fine looking blossom buds, but the severe cold snap in April killed the buds, and with the exception of here and there, in a favorable locality our apple trees gave us "nothing but leaves."

Plums, both cultivated and wild, were a perfect failure.

Cherries have never done well in this county, and the past season was no exception, currants and gooseberries were almost a failure, and the same report holds good in regard to the blackberries.

Raspberries did quite well, where the land was not too dry; those doing best were, of the black cap, Gregg, Doolittle and Souhegan, Red—Philadelphia, Shaffer's Colossal and Turner.

Grapes, where they did not winter-kill, were generally an average crop. The Janesville and Concord have formerly been about the only varieties planted, but we are growing better ones now, and this year we had fine crops of the Worden, Lady and Brighton, and we are satisfied that these can be grown with profit.

Our county needs greater variety of trees for shade, windbreak and ornament; there is a tiresome, sameness to the plantations. It is either soft maple, willow and cottonwood, or willow, cottonwood and soft maple. But we are going to do better in the future.

The hardy evergreens do generally well here.

The Larch is perfectly at home with us and makes good growth; and the walnut, butternut, elm, ash and linden are indigenous.

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REPORT FROM CLAYTON COUNTY.

BY O. H. TRUE, EDGWOOD.

A summary of brief reports received from different parts of the county indicate the almost total destruction of the earliest planted orchards. A very natural consequence that need not tend in the least to discouragement. The usual verdict over dead fruit trees has been, froze out, while facts prove that our people have not tried to grow successful orchards. Many are now turning their attention to our home nurseries, and with a judicious selection of young, hardy trees, especially adapted to our soil and climate, we feel assured of far greater success in the future than has attended our inconsiderate labors in the past.

The apple crop the past season was usually very light; a large proportion being produced by Duchess and Tetofsky trees. We find that in favorable locations, Fameuse, Haas, Tallman Sweet and the Russets may be planted with as great assurance of success as can trees of the durability of the Duchess in unfavorable localities, and it seems quite strange to some of us that such varieties are not recommended for special localities. No attention is being given to the cultivation of pears and but little to that of cherries. Some are becoming interested in the cultivation of our best native plums, of which our county has furnished a few choice specimens. As the lands are being cleared for the purpose of crops and pastures, our native plum groves are fast diminishing and our future dependence for this fruit must be in the cultivated orchard. The yield of plums the past season for some unaccountable reason is quite small. Nearly all varieties bloomed profusely, but few matured a crop of fruit. The Speer plum, of which I have a few, bore well at four years old. This, thanks to the introducer, is a very late plum; but we have a better, one larger and earlier.

Grapes produced abundantly and were of excellent quality. The varieties in general cultivation are Champion, Concord and Worden. The latter is making rapid strides as a very hardy, large and early grape of unsurpassed quality. Winter protection is being extensively practiced for all varieties.

Snyder blackberries, where not laid down, were a failure; those having winter protection bore quite well in spite of the long continued drouth. Stone's Hardy, standing upright during the winter, bore equally well as Snyder, having protection.

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The yield of raspberries in favorable locations was large. Tyler, Souhegan, Seneca and Minnesota Prolific are all quite hardy and prolific. Gregg is tender and the yield of fruit not satisfactory. Shaffer is being planted to considerable extent, and is well liked.

Currants were almost a total failure, and ten cents per quart was freely offered for them where they have usually gone begging. Insect injuries to this fruit is of very rare occurrence.

Strawberries also failed in many places, owing to a lack of moisture, during fruiting season, the yield being fifty per cent below the average. Crescent is most extensively grown, together with Captain Jack, Mount Vernon, etc.

We believe the cause of failures in the production of fruits generally the past season to be largely due to the long continued drouth, which was very severe. especially in the northeastern portion of the State. Although there has been much to discourage attempts at fruit raising during the past few years, our people are by no means disheartened, but still look forward with reasonable hopes of future success.

DECORAH, Nov. 28, 1887.

J. C. FERRIS, *Secretary:*

DEAR SIR—I have read your Hampton paper with notice of coming Northern Iowa Horticultural Society meeting. This is the first that I have heard from you since I sent you my promised paper on English sparrows some time since. Did you receive it? You must read it, or find a reader, as I cannot attend. I hope your Society will take some action to obtain a better bird law this winter, for birds in general and against English sparrows. I think I sent you a document from Washington on the same subject, to be presented with the report. And you will find published every month in the Audubon Magazine (40 Park Row, New York) the new bird law of New York State. This law is a good model for us to follow.

I am indignant at your paper's notice of a turkey and pigeon shoot by the "Audubon Club" of Hampton. I do not know or care whether that club assumed this honored name before the "Audubon Society for the Protection of Birds" was organized, i. e., last February in New York City. Decorah has a "Gun Club," merely for shooting game—birds in their legal season; not for study, nor for protection of our most valuable birds. Your "Audubon Club" seems to be a similar club of mere marksmen, who cannot be satisfied with shooting at targets or glass balls or clay pigeons, but must engage in the cruel sport of shooting at live turkeys or pigeons, often maiming instead of instantly killing them. In the name of the Audubon Society, of over 40,000 members (a branch of which I have founded in Decorah, with over one hundred members), I protest against such an abuse of Audubon's honored name. He was both a hunter and an artist. He *studied* the birds and befriended them, never killing merely in sport, often taking them alive, and releasing them after studying and painting their portraits. He says: "The moment a bird was dead the interest in it was

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gone," or to that effect. He drew a painting from life. Therefore his pictures are superior to many others.

There are nineteen branches in Iowa of the Audubon Society. If your town is not on the list, please use the blanks enclosed, send for more, and enroll members in the schools and out of them, both childen and adults. Any man or woman can be local secretary. The only expense is a few stamps for letters and a little book for names. We do not protect English sparrows, or forbid the wearing of ostrich plumes. or feathers of poultry.

I am glad to find that poultry feathers, in various devices, are much worn now in place of wild birds' feathers. These things are evidently cheaper. So far so good. But wild birds' plumage, where it is more abundant, as in many parts of our land, must even now be cheaper, as well as more attractive. Hence the slaughter continues and should be opposed by all legal and moral means. Hoping to hear from you soon,

Yours truly, M. R. STEELE.

BIRD HELPERS.

BY MRS. MARY TREAT.

(Mrs. Mary Treat, the well-known entomologist, writes in the American Agriculturist for October.

I wish to add my testimony in a few words in favor of the various birds that visit our gardens and orchards, in the capacity of helpers as they feed upon some of the most noxious insects which we have to contend with.

First and foremost among these helpers is the purple martin. It is the general impression that this bird takes insects only on the wing, but it does more than this. I saw numbers of them this past summer, taking the rose-bugs from the grapevines. They swooped down and picked them off without alighting. They circled around in companies back again to the same vine, each one snatching off a bug as it passed. And not only the rose bug falls a victim to its appetite, but it even stops to take the Colorado potato beetle. This has been seen by others in our town as well as myself. Put up boxes for the martins, and see that the English sparrow does not get possession.

Tae oriole is another great helper. It knows how to pull the bag worm from its case, and does it systematically and rapidly. The tent caterpillar and fall web worm it also has a liking for; it ruthlessly tears the tents and webs to pieces and destroys untold numbers. Allow no gunner to shoot one of these beautiful gayly dressed birds on your premises, not even if the lady of your choice is pining for the skeleton to perish on her hat. For several

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years past the leaves of our elm trees have been ruined by the elm beetle. Last year I noticed the cedar bird devouring the beetles and larvæ. This year our elms are comparatively free from the pests. The leaves are scarcely injured at all, and the cedar birds are obliged to look close to find a beetle They hunt over the trees in small flocks. They also destroy many other injurious creatures. This bird likes cherries. Raise enough for them as well as for yourself and they will pay you back with interest.

The catbird and the red-eyed vireo both eat the unsavory pear-slug. But it is not necessary to mention the good services rendered by our more common birds, such as the robin, brown thrush, catbird and bluebird and wren, as all observing horticulturists are aware of the good they do. Our winter birds are also doing good work. The seed-eating ones pick up great quantities of the seeds of noxious weeds, while our woodpeckers, jays and chickadees are constantly on the lookout for hibernating insects. Spare and encourage the birds, both winter and summer, about your home, grounds and fields.

HAWKS AND OWLS.

FROM THE NEW YORK SUN.

The ornithological division of the department of agriculture has been engaged for some time in an investigation of the effect of the law enacted in Pennsylvania in 1885, granting a bounty of fifty cents a head on all hawks, owls, weasels and minks killed within the limits of the State. The law was enacted for the alleged benefit of the farmers of Pennsylvania; and from the time it first went into effect until it was repealed, a few weeks ago, something like $80,000 had been paid out under it. The investigations of the department show that this sum is but a small fraction of the direct and indirect cost of the law of the State.

It is found that there are about fifteen species of hawks and owls in the eastern States. Of these only three varieties ever feed upon poultry. Within the past six weeks the department has examined the contents of the stomachs of ninety birds killed in the suburbs of Washington. In that of a hawk was found a portion of the head of a domestic fowl, which might have been the offal thrown out of some farmer's kitchen. In the stomach of an owl a portion of a domestic pigeon was discovered. These two were the only ones among the ninety in which there was any indication of a partiality for poultry on the part of the hawk and the owl family. Nearly all of the other stomachs examined contained from one to five field mice, as well as a great many insects, which are naturally very destructive to crops.

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Upon this showing the department estimates that each hawk and owl is worth $25 per annum to the farmers of the country. This estimate is based upon the assumption that every field mouse not caught will damage crops to the amount of two cents a year. The scientific men of the department who delight in figures have come to the conclusion that if every hawk and owl killed under the Pennsylvania county law had been allowed to live, the damage done by them would have amounted, under a very liberal estimate, to about $1,875 while the law was in operation. On the other side of the account book they charge up the $90,000 paid by the State in bounties, and $20 as the value of each bird killed. And they find that from the passage of the act to the date of its repeal the entire cost was $8,857,130, besides the damage done in the way of increased production of the vermin because of the depletion in the ranks of their natural enemies.

While the State of Pennsylvania has been trying to get rid of the hawks, the general government has been busy devising ways to make them more useful. Negotiations have been pending for some time between the chief ornithologist of the department of agriculture and a man who has had a great deal of experience as a trainer of falcons in Europe. These negotiations are for the purpose of securing the services of this man, to train a number of hawks for use in the rice fields of South Carolina. The planters there are clamoring for some method of ridding their fields of rice birds, which play frightful havoc with their rice fields every year. It has been found that the presence of a living hawk in the air over the fields of rice will cause the immediate departure of every bird in the vicinity. Guns, drums and other implements for creating a great noise are only partially successful. A stuffed hawk will do well enough for a day or two, but the depredators soon learn there is little to fear from a dead enemy. It is therefore proposed to try the effect of trained birds. It is the purpose of the department to begin with a small number this year, and if the plan proves successful as to the rice birds problem, it is likely that every rich planter in the south will be supplied, in the near future, with a flock of falcons.

INDEPENDENCE, IOWA, December 7, 1887.

JOHN C. FERRIS, *Secretary Northern Iowa Horticultural Society:*

DEAR SIR—My business is such that it will be impossible for me to meet with you at this time, and I regret it very much, as I have always taken a deep interest in the culture of fruit, especially apples I might say a few words in relation to the progress that has been made in fruit culture in this county. The prospect for raising apples was very flattering until about six years ago, since when we had a succession of hard winters that ruined all the trees except the most hardy varieties, but at this time I think that with the hardier varieties we are getting, that those that have kept their orchards replaced with good hardy trees where the old stock has died out, that in such cases the orchards are on the mend.

I wish to say a few words in regard to the Duchess apple. I think them among the best apples we raise, and their keeping qualities are much better

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than many persons know; your president, Mr. Patten, can tell you how I manage them.

The smaller fruits, such as grapes, and the various kinds of berries are successfully raised, and in great abundance.

I hope your meeting will result in much good, and I regret very much that it is impossible for me to be with you. Please send me a report of your work, if convenient.

Respectfully yours,

J. J. TRAVIS.

MAPLETON, MONONA CO., IOWA, November 29, 1887.

MR. JOHN C. FERRIS, *Hampton, Iowa:*

DEAR SIR—The circular, with programme, came to hand. I am glad that there is such an interest in hardy fruit in every direction, as it is very much needed. It is not more than a week ago, that the old varieties (tender ones) were in their sap, and now, we had thirty-two degrees below zero yesterday. Some trees bursted in their trunks, and only the hardier Russians kept dormant. The Bessemianka pear is fifty per cent hardier than Flemish Beauty, but not exempt from blight; so is Peffer's No. 3. My seedling plum was full as good as I could expect, and right here I would say that we soon shall be able in Iowa to take the lead in new varieties of plums, but we want to keep on planting seeds; the same with every other kind of fruit. Every section needs fruit of its own; so different soils, but the right kinds of fruit for Iowa will come, make haste slowly, go to rock bottom and build up. Don't be ashamed to acknowledge mistakes. I wish you a profitable time.

I received, just now, the crop report of the department of agriculture, which states that the crop of apples at large is very much below the average, so we ought not to expect a full crop always.

With good wishes to you all.

CHRISTIAN STEINMAN.

LEHIGH, WEBSTER CO., IOWA, December 5, 1887.

JOHN C. FERRIS, *Hampton, Franklin Co., Iowa:*

To-day I send three varieties of my seedilng apples to present to Northern Society. I have sixty varieties of Russian apples and some of Gideon's Minnesota apples; I would not take $10 a tree for 3 M. 200, 28 M. Boiken, Possart's Naliva, Romna, English Pippin, Bogdanof, Golden Reinette, 502, 252, Low, Excelsior and October, if I could not replace them. I have had three varieties of Russian pears, three seasons; they neither winter kill nor blight; they are extra in tree. Swinsovka, Titus Riga and 8 M. are worthless with blight.

SILAS G. GOSS.

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BUDDING VS. ROOT GRAFTS.

Canvassers are doing a rushing business selling budded apple trees, and they are finding many believers of their story that our orchard troubles have all come from root grafting on pieces of seedling roots. As these budded tree chaps seem to be distributed well over the State the real facts should be kept before the people. Trees budded on any obtainable seedlings are not worth planting in any part of Iowa, as not one seedling in five hundred is as hardy as our common grafted sorts. Hence if the Duchess of Oldenburg, Wealthy, Whitney's No. 20, or even the crabs, are budded above the crown on common seedling stocks they will soon go out by root killing. But the wily agents claim their trees to be budded on French crab stocks. If true, this is still worse, as the so-called French crab seed is from the Perry making sections of South France, and their seedlings are as tender with us as the peach. Absolutely, there is nothing in the artful story with which so many are now being deluded.—J. L. BUDD, *in State Register, Feb. 18, 1887.*

In view of the fact that there are many unscrupulous tree peddlers traveling over the State selling apple trees said to be budded on seedling stock, claiming that such trees are far superior to all others, the State Horticultural Society, at its late meeting held at Charles City, passed the following resolution, which we hope will be published as widely as possible by the newspapers of the State, thereby informing the farmers on such matters and save them from being swindled:

Resolved, That it is the sense of this Society, that apple trees budded on French crab stock or any other stock not hardy, are not valuable for commercial use, as such trees are liable to be root killed the first severe winter after planting.—G. B. BRACKETT, *Secretary.*

The idea is perfectly plain and reasonable that the root graft is superior to the bud.—J. S. B. THOMPSON, *the Grundy County seedling orchard man.*

The Northern Iowa Horticultural Society after thoroughly discussing the subject of budding on seedling roots, unanimously adopted the following resolution:

That it is the sense of this Society that the principle of recommending budded trees by Eastern men should be condemned. See Horticultural Report, 1885, page 496.

The budded tree cry, in my opinion, is a fraud, deception and swindle—JAS. UNDERWOOD.

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If budding on common seedling stock, grown from seeds of common eastern apples, is superior to root grafts, then withhold the two thousand five hundred support of the State to the Horticultural Society; close the Agricultural College; send Prof. Budd and all other members of the Horticultural Society to the shade of oblivion, and—send to Troy, Ohio, import three men to take charge of our tree interests, one of which should be sent to the capitol to take charge of the horticultural rooms there, and one for the Agricultural College to there take charge of budism, the other to lecture from house to house and to instruct farmers' alliances, institutes and clubs in budism, tap roots, fall planting, etc. (to get, I suppose, winter varieties out of the pear, apricot and the Red Astrachan apple, etc.).

Now, to all interested, just take your medicine, and if some get a little choleric, take! "Shentlemen! you vill feels better ven you gets over dis.'

JNO. C. FERRIS, *Hampton, Iowa:*

DEAR SIR—Notice of meeting and programme of the Northern Iowa Horticultural Society received. Sorry that I cannot be with you, to reap my share of the benefits resulting from the discussion of the subjects proposed. Old age and ill health make it necessary for me to be cautious, and not expose myself. I have had but little experience in horticulture, but enough to make me a convert to the good cause and to bid you success in the noble undertaking of trying to solve the mysteries of northern and northwestern horticulture. We of the north and northwest are vitally interested. That the problem will be solved I have not the least doubt.

Respectfully,

C. ROWSE.

Independence, Dec. 6, 1887.

REPORT OF FAYETTE COUNTY.

BY H. W. ASH, WEST UNION.

The apple crop was light. But few trees, besides Duchess, Wealthy and Tetofsky matured their fruit. Some were injured in the blossom by late frost, many more fell as wind falls. The dry weather and low vitality of many trees were some of the causes. Crabs and hybrids bore their usual full crop. De Soto plums were very good, Miner fair; no other of general planting bore fruit worthy of being mentioned. Grapes were by far the

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best ever produced in the county. Concord, Worden, Janesville, Martha and Moore's Early did well, their merit seems to be in the order named. All small fruits suffered from the long continued drouth. Those who cultivated were well repaid for trouble and expense. Many new varieties have come into notice. Some possess merit, but trial will determine their value. More general attention has been given to the growing of evergreens, and the planting of ornamental trees and shrubbery. An earnest desire is expressed for more and hardier apples, for earlier ripening and prolific plums, and for improved varieties of small fruits; all of which the society to which this paper is addressed, I trust, are endeavoring to produce.

EXPERIMENTAL HORTICULTURE.

BY G. B. BRACKETT.

Facts in horticulture like facts in any other department of science cannot be established without experimental work, and these facts cannot, as in chemistry and and other sciences, be demonstrated in a few minutes or hours. Time is an important factor in working out these problems. Any one of experience knows full well that merit in new varieties of fruits can be determined only by time. Knowledge of this kind can be obtained only through patient toil and waiting.

The testing of old varieties under new conditions and the production of new varieties adapted to certain localities constitutes the two lines of experimental horticulture to-day, and in neither of these lines can results be reached or facts deduced in one short year or even ten. Those of us who were pioneers in the horticulture of this State know full well of the trials and bitter disappointment we met with in our first planting of orchards, when we thought that the varieties of the Eastern States would succeed just as well here as they did there. It took long years of experimentation to teach us the lesson that adaptability of varieties to soil and climate was an important requisite for successful orcharding. We were sadly disappointed to find that those varieties we so highly prized in our boyhood days would not stand the change of soil and climate to which they were subjected by removal to this new country. We did not know as much then as we do to-day. We could not understand why a tree that would grow and thrive in Massachusetts or New York would not do just as well in Iowa. It took from thirty to forty years of actual trial to teach us that such was not the fact. This lesson could be learned in no other way. There was no process of reasoning that could have worked out this problem of adaptability. And yet is not history repeating itself? Are we not doing the same thing

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over again by planting largely of varieties imported from foreign countries before they have been tested? Are we not shutting our eyes to the lessons taught us by the experience of the past, and by a process of reasoning trying to accomplish that which we learned only by experiment? In view of the past and from the fact of the mania for Russian fruits and other new varieties, no matter what they are, is sweeping over this section would it not be well to use moderation and caution before planting largely of any untried sorts?

The all important question in horticulture at this time is how can we best secure fruit trees that will not only be able to stand the tests of our severest winters but will produce fruit of high flavor and long-keeping qualities. This can be accomplished only by experimental work, by actual trial for a considerable length of time of old and new varieties under varied conditions of soil and climate. The trial of old varieties under new conditions is now fairly under way in all parts of the State

The several experimental stations established by the State Horticultural Society and the Agricultural College have many varieties on trial, but the work has not been carried on long enough yet to determine the value of but a few sorts of apple. The fact that some of them are sufficiently hardy to endure the climate is pretty well established, provided the tests shall not be greater than for the past four years, but as to their keeping qualities and high flavor it is still somewhat doubtful.

The other line of experimental work, that of producing new varieties from seed has received as yet but little attention in our State and as far as large fruits are concerned there is nothing being done in a scientific way in other States. Now and then there is a chance seedling picked up and brought to notice, but however there is quite a number of experimenters who are doing a good work in the way of producing new varieties of small fruits, the results of which we see in the great variety of grapes, raspberries and strawberries which are now offered for sale. The reason that so much more is done in the small fruit production is because there is much quicker returns from the labor performed. If the same persistent effort was made in the direction of producing new varieties of the apple that is made in the line of small fruits we might expect to have apples that would stand our cold climate. This work cannot be carried on in any slip-shod, hap-hazard way. No certain results can be obtained by the indiscriminate planting of seeds, for every one of experience knows that seedling fruits produced in this way are very uncertain as to hardiness as well as to the size and quality of the fruit. The parent tree from which the seed is taken may be all right in every respect, yet the trees grown from this seed may not have a single desirable quality. This is the result of chance fertilization. Definite results can be obtained only by carefully obeying the laws governing the origin of species. Artificial fertilization must be performed with the most scientific accuracy and seeds obtained possesing known desirable qualities. When this system of experimental horticulture is pursued in an intelligent and persistent manner there can be no question about the final result.

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DISCUSSION.

Mr. Underwood: That paper sounds the key note of future success. When we see what has been done in producing new and improving old varieties without system and scientific knowledge, we may believe that with the benefit of present light and knowledge we can in a short time produce hardy, large, nice fruits. Our apples have not come by chance. The great God of the Universe has the ruling of fixed laws and if we can find the law that will give us hardy apples for northern Iowa, we will have reached a grand success..

Mr. Gideon: I have had experience in cross-seedlings and I know we cannot get just what we want or have in our mind. There is not one seed in 500 that will produce a first-class apple, and not one in 1500 suited to Minnesota. I plant my trees in close proximity, and the result is a great many poor apples and a few good ones from the same cross. Those who transport pollen by hand may help to improve our fruits, but as yet they have attained no results of practical value.

Mr. Speer: The Shetland pony and draft horse are from the same origin. By intelligent crossing we have increased the milk of cattle, the wool of sheep, and have produced the fleetest horses, the bird, dog and have attained excellence in other animals. We have bred the Berkshire hog—has been bred to always have four white feet, a white tip on the tail and a star in the forehead. That line of work could be carried to such perfection that the star would always have just twelve white hairs. In time we can bred an apple that will stand 45 degrees below zero. Yet we can now go and get those that have been bred up to nearly perfection and we can get good apples. Much has been done for us by climatic influences and much more may be done by intelligently directing the crosses. Animal breeders work is less difficult and not less important than ours.

Mr. L. K. Raymond: On behalf of the citizens of Hampton invited the visiting members to a banquet at the Reed House after the evening entertainment.

The society accepted the invitation in a resolution expressive of pleasure.

Mr. Thompson offered a report of fifty new chance seedlings of good quality and high flavor.

President Patten: We do not and can not dispute that we get good seedlings by chance crossings through the work of birds, insects

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and other agencies. We expect good results from Russian hybridization with our winter apples. We cannot determine the results, except by experience. I do not believe this is a chance world, but by observing we may accomplish more speedy results.

VALUE OF FOREST TREES.

BY D. W. MOTT, HAMPTON,

For the practical farmer of Iowa the forest tree question has been pretty thoroughly and I might say sufficiently discussed, but for the impractical or improvident farmer, the one, who, after these years of horticultural meetings and thousands of dollars expended in publishing the reports of men who have given years of time to the testing and experimenting of varieties; to the farmer, who, at this time, has no grove around his house, barns and buildings, who does not attend your meetings or read the books or papers you publish; what are you going to do with him and how are you going about it?

I am to weak to solve the problem; will have to pass. There might be a few men who will become farmers that it will not harm if I name a few common forest trees of rapid growth. The Cottonwood, White Willow, Soft Maple, Catalpa, Honey Locust, Elm, Ash and Box Elder. For comparative growth they stand nearly in the order named. As regards value in the future there are many better. Would place at the head the Burr Oak, then Black Walnut and Coffee Bean; the Oak I do not know how to propagate. My Black Walnuts, (several hundred), died last winter. I saw many Butternnts of 5 to 10 years' growth, at least ruined: so the propagating and growing of some of our valuable deciduous trees, the same as our evergreens, will require men of some experience.

But those first-named are valuable. It is possible to grow three thousand White Willow poles to the acre, and I have said that where poles or posts were wanted, they could be grown in ten years to be worth one thousand dollars per acre—not three thousand, as the printers made me say in last year's report. This would, it is true, be an exceptional growth, but entirely possible. I have seen a row of White Willow grown by the roadside sold at three dollars per rod; but at one hundred dollars an acre, ten acres grown in ten years has given you as much profit and more comfort—comfort to each member of your family and to every animal than the same number of acres on your farm. Put out the trees, raise less grain and grass and you will get more money for what you do raise. We are, as a nation, raising too much wheat, too many cattle and not enough trees.

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DISCUSSION.

Member: I have planted Hickory trees successfully. The subsoil was a thick solid clay.

PROPAGATION OF SMALL FRUITS.

BY ELMER REEVES, WAVERLY.

On this as on other subjects enough has been given in most of the horticultural reports to enable all to grow an abundance of small fruits by simply following the directions given. However, these reports are constantly reaching new readers, and besides it is well to emphasize the main points by repeating them often as possible.

First, as to strawberries. For these the ground can hardly be too rich. Choose soil already in good condition, spreah on all the manure that can be plowed under. After plowing harrow the ground thoroughly. Set them one and a half to two feet apart in the row, and the rows three feet apart. In setting let the roots hang straight down and pack the earth hard around the plant. Too much stress cannot be placed upon this point, as more trees and plants are lost by carelessness in this particular than in any other way. Cultivate thoroughly the same as you would for corn, only oftener, and hoe or pull all the weeds that start in the row. The same cultivator used in the corn field will do good work among the strawberries. Cultivation should continue all summer, or as long as weeds grow. When the runners interfere too much with the cultivator the work must be done with the hoe. Care should be used not to injure the roots as they are close to the surface. Bear in mind that keeping the weeds under control is not the only object of cultivation. The main thing is to keep the soil mellow, as nothing will flourish if the ground becomes hard.

To produce the greatest yield of fruit several varieties should be set in the same bed. This is not a necessity, however, as there are but few varieties that are not self-fertilizing and if it is desired to keep these pure, plant them alone and at blossoming time hunt a wild bed of fine staminate plants. Mix in a few of these and a good crop can be expected.

There are many good varieties among the old sorts. A bed set with Crescent, Manchester, Red Jacket and Mt. Vernon, is prehaps as good as could be desired and will give early and late berries.

Get plants for new beds where each variety is pure. Those taken from old beds may grow well and blossom, but will rarely produce much fruit.

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This is on account of seedlings from berries not picked. An experienced grower will not take plants from an old bed as a gift.

About the time the ground freezes the bed should be covered with prairie hay, straw or any litter that is free from weed seed. Manure makes a good cover. In spring rake the covering between the rows or on any bare spots, but do not remove it as it will protect the crop in time of drouth, and also keep the berries clean.

For raspberries and blackberries prepare the ground the same as for strawberries. In my last planting the rows are seven feet apart, and the plants two and one-half feet apart in the row. Cultivate thoroughly and the first fall trim the canes to about two feet in length. The second season they may be left three to four feet long and laterals about one foot. I prefer triming late in November, as earlier triming induces a new growth, which is sure to injure the plants. Before the ground freezes throw a spade or two of earth on the crown of each plant as a winter protection and and to steady the canes during high winds of winter.

Blackberries should be covered with earth as a winter protection. This is a hard job but it is necessary to insure a crop of berries in this latitude.

Currants need a rich soil and good cultivation. Decayed wood, sawdust, chips and ashes are good fertilizers for the currant. The Victoria is much the best variety for general planting.

Small fruits have become a necessity and each is best in its proper season. The grower of small fruits cannot be robed of the labor of years in a single severe winter as he could, if his attention was given to the growing of apples in our northern climate.

SEASON FOR TRANSPLANTING STRAWBERRIES AND RASPBERRIES.

BY E. K. FROST, CHAPIN.

Mr. President.

I might answer this question in few words and not give much information upon the subject, or I might vary the theme by giving my experience of many years among the fruits, both large and small, by telling *when* to plant, *how* to plant, *what* to plant, with hints for cultivation and thereby make the subject interesting for new beginners.

As a general rule, early in spring as soon as the soil is in condition to work, and plants show life, is the best time to transplant.

But all *rules* are subject to conditions and exceptions. Owing to the extreme drouth last spring and summer, no fixed time nor rule would apply.

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My first planting of the strawberry last spring was middle of April. Seven plants of new Jessie strawberry from Geo. J. Kellogg, of Janesville, Wisconsin. The soil was very dry. I dug holes and poured a quart of water in for each plant and planted. These seven plants all lived and grew slowly. I let two of these plants bear fruit and they died, the other five lived and made about 200 fine new plants. Ten days later I received from R. D. McGeehon six Jessie, 44 Buback and other old varieties about 1,500 plants in all. Two of McGeehon's Jessie lived and 14 out 44 Bubach lived and grew finly from these 16 plants. I now have 1600 new ones, strong good plants, two good new varieties. The foregoing described plants were all treated alike, but 1000 out of the 1500 died.

McGeehon's plants *heated* in the package in transit from Atlantic to Chapin. No rule would apply for above transplanting.

About the same time in April and May of present year, I took up on my own grounds with transplanter and spade 1600 plants, keeping all the soil possible on the roots and set them in holes previously dug and filled with water, pressing the plants well down. All these 1600 plants except 24, lived and did well. That was the *best time* and the *best way* to set those plants. If I had shaken the dirt off and set those plants the same as McGeehon's, they probably would have died.

In August and September of this year, the weather and soil were in good condition for planting strawberries. I set several hundred new plants, filled all vacancies, using transplanter for all. October 1st I had the best acre of strawberry plants that I have ever had, but they have cost me a great deal of hard labor, care and attention.

I have planted and grown strawberries occasionally for 50 years, and nine years for market on the farm, I now occupy. I have had good success. I have tried nearly all the popular new varities, 50 or more, having received plants from Connecticut, New York, New Jersey, Wisconsin, Indiana and Iowa. Many of the highly praised eastern varieties are nearly worthless in northern Iowa. We need varieties adapted to our soil and climate as much as we need apple trees adapted. Leading varieties now on hand, Crescent, Cumberland, May King, Windsor C, Glendale, Boone, Boyden, Wilson, Iron Clad.

Jessie and Burbach new and most promising of all.

Black cap raspberries I have planted and grown for market twenty-five years.

The best time and the best way I have found for transplanting is when the new tips have sent up new shoots an inch or two high, then take them up with spade with soil adhering to the roots plant in holes previously dug in rows seven feet apart and three feet in row. I have 1000 plants transplanted as above described, two years ago from which I picked last July and August 1500 quarts which netted me $147.

If plants are to be shipped, care should be taken in packing, for if they heat in the package they are ruined and will not grow. Red raspberries can be planted in either spring or fall. There is great demand for reds, and they would be profitable if they could be grown successfully.

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Moses Robinson: I have had eighteen years experience in strawberry culture. I have grown the Crescent seedling for the last ten years. I renew my beds often, as strawberry seeds grow very readily and the beds are run out by their seedlings. I have transplanted successfully when the fruit was nearly ripe. I consider the Crescent the best of fifty varieties I have tried. It is a self fertilizer. I have had splendid crops from beds of pure Crescent. Last year I had two-thirds crop. This year the drouth affected the crop more and I had one third crop. I consider 5,000 quarts from three-fourths acre a full crop. Had half crop from James Vick. Strawberries require a rich soil and plenty of well rotted fine manure, then plenty of clean culture with the hoe. James Vick gave half a crop and Cumberland two thirds crop this year.

REPORT OF COMMITTEE ON REVISION OF FRUIT BEST FOR NORTHERN DISTRICT.

Apples for general planting—Tetofsky, Duchess, Whitney, Wealthy.

For favorable localities—Haas, Fameuse, Tallman Swaet, E. G. Russet.

For trial—Lou, Excelsior, August, October, Mr. Patten's No. 1, Mr. Patten's No. 3.

Crabs—Earley Strawberry, Brier's Sweet, Martha, Virginia, Minnesota.

Russians for general planting—Thaler 342, Hibernal 378, Garden 214, Longfield 161, Little Hat 272, Borovinka 245, Yellow Transparent 334, Grandmother 469, Large Long White 979, Charlamoff 262, Lead 277, Antonovka 286, Riga Stripe 10, Arabka 155 or 257, Silken Leaf 327 or 240, Cross 413.

Russians for trial—Yellow Sweet 167, Smeling 264, Pear 267, Pearsian 318, Lubsk Queen 444, Polumison 198, Aport 252, Sacharine 268, Repka Kislya 466, Red Anis 985, Yellow Anis 987, White Russett 981.

Currants for general planting—White Grape, Victoria.

Gooseberries for general planting—Downing, Smith's Improved.

Cherries for general planting—Not any.

Cherries for trial—Valadimair, Wragg.

Pears for trial—Bessemianka 508, Gakovska 347.

Plums for general planting—De Soto, Miner.

Grapes for general planting—Worden, Moore's Early, Concord, Lady, Janesville.

Blackberries for general plantiug—Snyder.

Raspberries for general planting—Tyler, Senica, Turner, Hansell, Shaffer's Colossal.

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Strawberries for general planting—Crescent, Bubach No. 5, Windsor Chief, Mt. Vernon.

W. C. HAVILAND,
S. W. FERRIS,
N. A. REEVES,
J. B. MITCHELL,
C. H. TRUE,
Committee.

DISCUSSION.

Mr. Gideon: The Minnesota is hardy, but it has been discarded in central Minnesota on account of quality. We have others on the list not as good as Minnesota.

Member: The Roman Stem is a good tree.

S. W. Ferris: I have grown the Minnesota, and it is as hardy as any Cross. I kept half a barrel in my cellar until holidays.

N. A Reeves: The Minnesota, we had a good while. There is nothing in the list not fully considered by the committee and accepted by all. As to quality, the Minnesota is a fairly good apple when fully ripe.

Mr. Underwood: The Minnesota has given satisfaction all across northern Iowa.

Mr. Mitchell: As the Minnesota grows older it becomes a better bearer. I have seen large trees loaded with fruit. It becomes a good bearer.

President: Thaler and Yellow Transparent cannot be recommended with safety if our winters continue as cold as the last. They are good bearers, but have not proven very hardy.

S. W. Ferris: I have had the Yellow Transparent for the last three years. We decided that it would do.

Mr. Speer: I do not think it best to vote upon the list without full discussion. I have my fears that there are some that are not all right. I have 100 varieties that will prove hardy, as some years have adopted and better for trial. Yet I have some that I could not, for I have one hundre and fifty Russian apples, and many others have a great many varieties, and many good ones, which should be added if we adopt a list. I do not think it is yet time to recommend a list of Russians. It will shut off others that are just as good.

Mr. Haviland: We should recommend those which have been proven worthy. We can add to the list as others are found good. We asked advice of the members, and everything which has blighted

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or been found defective was discarded. If Mr. Speer wants to add to the list anything he knows to be good I am willing.

Mr. Speer: We can neither supply the demand which will arise for those on the list or dispose of those left off, though equally worthy.

Mr. Haviland: If we do not recommend a list we will never get them introduced. If I cannot get some encouragement from the Society I am going to stop growing these trees.

J. C. Ferris: I think the time has come to adopt a list, and the committee have taken time and probably chosen as wisely as the whole Society could do.

President: I concur in the thought expressed by the Secretary. If we publish the two lists we should note in the second list that there are others considered of equal value. If we add to the list we should exclude some already there.

Mr. Haviland: I have twenty-five or thirty very worthy varieties not in the list. If we throw the Russian list out I am going to quit the nursery business.

Mr. Speer: The Roman Stem is one of the best trees of the old varieties.

B. F. Ferris: In recommending a list we must consider varieties which will stand up to the north line of the State. I think the Roman Stem doubtful as to sufficient hardiness.

Mr. True: If this list was only for my neighborhood, I would advise Talman Sweet and the Russetts on high and dry heavy clay soils. I would not object to Roman Stem. Tetofsky, Duchess and Wealthy we must have.

Jno. C. Ferris: I move to amend the report by adding the words: "There are many other varieties of Russian apples considered equally worthy of trial."

Carried.

Report adopted as amended.

Report of committee on premiums accepted.

Report of committee on president's address, secretary's report and treasurer's report read.

Your committee to whom was assigned the duty of awarding the special premiums offered at this meeting, beg leave to report as follows:

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Premiums offered by Sioux City Nursery Company: Best display of garden and tree seeds; to J. C. Ferris, Hampton, $10.

Premium offered by B. F. Ferris: Canned plums; C. H. True, Bixby, $5.

Premium offered by W. C. Haviland: Fruit and forest tree seedlings; no exhibit found.

Premium offered by C. G. Patten: Best exhibit Russian apples; to J. B. Mitchell, $3.

Premium offered by Eugene Secor: Best native plum; C. H. True, $5.

Premium offered by Wm. Koehl: Collection canned strawberries; no exhibit found.

Premium offered by R. P. Speer: Best exhibit seedling apples; to J. S. B. Thompson, $3.

Premium offered by J. B. Mitchell: Exhibit canned grapes; J. A. Walford, $2.

Premium offered by S. W. Ferris: Best seedling apple that will keep until January, (No. 28); to J. S. B. Thompson, $2.

Premium offered by E. M. Reeves: Specimen Russian apple of desirable quality that will keep to January; no specimen found worthy.

Premium offered by Edson Gaylord: Best seedling apple of season; J. S. B. Thompson, $1.

Premium offered by C. F. Gardner: Best Russian apple of any season; J. B. Mitchell, (No. 28) $1.

EDSON GAYLORD,
C. L. WATROUS,
GEORGE RAMBACH,
ELMER REEVES,
Committee.

REPORT OF COMMITTEE ON SECRETARY AND TREASURER'S REPORT AND PRESIDENT'S ADDRESS.

Your committee to whom was referred the President's address and Secretary's report, having had the same under consideration, beg leave to report: We find several recommendations in the President's report that seem to your committee worthy of affirmative action by resolution, as follows:

Resolution, That it be considered the duty of the working members to devote a reasonable amount of time during the year to writing for their home papers, giving the result of their experience and study on horticultural subjects.

Resolution 2d, That we hold it one of our highest duties to plant as extensively as our means permit, the best seeds of most promising trees and

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plants, with a view to cross-fertilization and the breeding of new and improved varieties.

Resolution 3d, That this Society ask of the State Society an annual appropriation of $100, to be used for the interests of this Society, under direction of its officers.

C. L. WATROUS,
W. C. HAVILAND,
E. M. REEVES,
Committee.

Resolution amended to read $50 in addition to former appropriation. The latter to be used for experimental and other purposes.

Moved to consider resolutions by sections.

Section 1 read and adopted.

Section 2 read and adopted.

Section 3 read.

Mr. Speer: At the last meeting of the State Society an annual appropriation of $50; this would make $150 a year. I shall oppose the resolution. It is the duty of its members to guard that fund of the State Society for experimental purposes.

Jno. C. Ferris: I think we should only ask for $50 in addition to former appropriation. We can use the experimental fund to quite as good advantage locally as we can to have it disbursed from a central station. I move to amend the third resolution to read $50 in addition to former appropriation; the latter to be used for experimental and other purposes.

Carried, and resolution adopted as amended.

Report of committee adopted.

The President announced that election of officers was next on the programme. The constitution was so amended as to admit of the election of a recording secretary.

Recess of five minutes.

Society called to order by President Patten.

The following officers were elected for the year 1888:

President—W. C. Haviland, of Fort Dodge.

Vice-President—R. P. Speer, Cedar Falls.

Secretary and Treasurer—Jno. C. Ferris, Hampton.

Recording Secretary—Elmer Reeves, Waverly.

Edson Gaylord invited the Society to meet at Nora Springs in 1888.

On motion Nora Springs was chosen as the next place of meeting.

On motion adjourned until half-past seven o'clock.

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EVENING SESSION AND ENTERTAINMENT.

Society called to order at 7:30.

On motion of Secretary, Mr. Amos Clark, Mr. A. C. Boales, Miss Eva Jackson and Mrs. George Higley were elected honorary members. The gentlemen and Miss Jackson were so honored in consideration of their services as reporters, and Mrs. Higley for her untiring and successfnl labors in preparing the programme about to be presented by the Franklin County Horticultural Society in honor of the third session of the Northern Iowa Horticultural Society in our town and county.

President Patten resigned the chair to Dr. O. B. Harriman, president of the Franklin County Horticultural Society, who read the programme of the exercises of the evening.

The literary entertainment under the able management of Mrs. Geo. Higley, was worthy of all praise. Everything presented was choice and rendered in perfection.

Miss Avery and Miss Emma C. E. Sutton read essays which were pronounced the finest ever read in any of our meetings.

After the entertainment the members repaired to the Reed House, where a sumptuous banquet had been prepared by the citizens of Hampton. It was enjoyed by all, and many members desired to give some public expression to the pleasure they had derived from the stage exercises, and the hospitality of the people of Hampton.

They are very thankful to the county society, and to all who so royally entertained them.

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CROAKERS.

BY JNO. C. FERRIS, HAMPTON.

Our genial ex-president, Hon. Silas Wilson, calls these meetings "horticultural love feasts."

At a love feast everything should be good, and there should be no grumbling or scolding. All should be peace, and all we partake of should give pleasure.

Our meetings are characterized by a cordial interchange of encouraging words.

We take great pleasure in recounting our triumphs and congratulating our friends upon theirs. Words of cheer do us good. But we have enemies to contend with, and we must enumerate and describe them, that they may be exterminated or suppressed. Among the birds and insects we have both friends and enemies. The weeds we have no use for, so we kill them.

We recognize the swindling tree agent as an enemy to true advancement. I wish to say a few words about his opposite, who is sometimes his victim; the croaker, who may be found in every land under the sun. He is there to tell the people that they cant. No matter where he lives, he knows "this will never be a fruit country."

Now we all know that in every land which is fit for human habitation, fruit may be grown. When the croaker goes to a new country he takes great pains to prevent its development. If it developes in spite of him he gets mad and moves, but while he stays he is busy telling poople what they can't do. They can't raise any fruit he says. When they do begin to raise any certain fruit he says that particular kind will be overdone and become so cheap that it will not pay for raising. Whatever the result he always says, "I told you so."

If men travel all over two continents and gather the best of both, or if others spend all the best years of life planting multitudes of seeds, and rejoice in the production of a single specimen, which they know will prove a blessing to this and coming generations, he rejects the work of both, declaring that he has spent all the money he intends to in such nonsense. Perhaps he smokes or chews, or both, drinks all manner of poisonous things, belongs to all the secret societies and clubs in his town, which he visits, and

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from which his wife and children are excluded. Yet he is not going to fool away his money to procure fruits to cheer the circle gathered round the hearth, which he finds too cheerless for him.

But the croaker is not always a reckless profligate. He is sometimes too virtuous and too mean to dissipate, but whatever his habits, he never attains "the true pathos and sublime of human life."

"To make a happy fireside clime,
For wee'uns and wife."

And now having indulged in a quotation another occurs:

"There once was a frog who lived in a bog,
On the banks of lake Okefenoke,
And the words of his song,
Which he sang all day long,
Were croakety, croakety, croaky."

When the old frog croaked all the little frogs of course replied croakety, croaky. Being frogs and having always lived in a quaking bog they thought all stories of animals who stood on solid ground were mythical. Indeed they did not believe there was any solid ground and if they saw a bird in a tree they believed (and hoped) he would fall and break his neck. The poet says a mocking bird flew up in a tree and cried "croakety, croaky," and the old frog thought frogs could climb trees, and tried and his lovely green neck was broken.

Frogs cannot climb trees nor can the constitutional grumbler ever mount very high. If his complaint was not catching we might leave him on his bog and let him croak and not croak about him. His music is discordant enough, but when all the little frogs and mocking birds croak, it becomes almost distracting, and much more so because the *words* of their song are so often true.

Intelligent, temperate criticism is necessary to progress, but we do not like to be told that all roads lead to perdition. We do not hope to reach perfection, but we will not yield to despair. We are moving on and up and soon we will be so far away from the swamp that we will not hear the frogs. We expect to stand upon solid ground but then we do not expect that frogs will believe it. The real downright croaker is the most irrepressible enemy we have at present. It is a pity we cannot dispose of him as we do of the weeds, but as that is not lawful, we must advance beyond the sound of his doleful song.

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HUMBUGS.

BY EUGENE SECOR.

Numberless are the "bugs" that blight the hopes and wither the prospects of the lover of fruits and flowers. From the time when the first bursting bud gives promise of speedy spring till the ripened fruit is garnered, there is a continued warfare between the grower and the insects (generally denominated "bugs") that levy tribute on our labors.

Eternal vigilance is the price of everythiug worth possessing. Not when man has planted is he sure of harvesting, for some far-seeing "bug" may have anticipated his work, and also planted in the congenial soil the germ of a living thing ready to spring into life cotemporaneously with the sprouting seed, and contest the right to life, liberty and the pursuit of happiness under that inexorable law the survival of the fitest. Not when nature has smiled on the work of his hands, and through the influence of kindly sun and genial shower the scented blossom proclaim anew the promise of reward for patient watching and waiting, is he exempt from care and danger, for some other "bug" may be noiselessly depositing in the pollen dust the egg that shall develop the worm that shall gnaw at the vitals of his prospective fruit. And thus wageth the battle continually.

But numerous as are the entomological bugs, named and unnamed, the humbugs outnumber them all. Destructive as are the little pests that prey upon the fruits and flowers of our planting, their work is as nothing compared with inroads on man's labor by this larger *genus*.

One consoling thought of the Iowa horticulturist is, that during at least six months in the year he does not have to powder and pinch, sprinkle and burn these entomological enemies. They are safely locked in the frigid embrace of old Boreas. But the specimen which we are considering is no "spring chicken." He doesn't cease to "bore" when the ground freezes. When the other bugs are hibernating he is as lively as a cricket in August.

In spring he works the ambitious novice who is anxious to get some novelties before his neighbor has thought of it—for instance, strawberries with great names and great expectations. In summer he bores with consummate skill the lazy farmer who is too sharp—that is, too penurious—to pay money for knowledge disseminated through the regular channels. In fall he may be seen basking in an Indian summer sun, unfolding its lovely

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colored plates to some solitary granger whose mouth is watering for the luscious fruits of his boy-hood days. In winter, he hugs the kitchen stove and kisses the farmers babies, while he and his innocent spouse drink in the fairy like tales of Russian sweet cherries for Manitoba. Verily "thou hast all seasons for thine own" O humbug!

Douglas Jerrold is quoted as saying: "After a season the world gets tired of its old, old truths, and hungering and thirsting for a good lie, will swallow anything." I wonder if that is the reason people take so kindly to the unknown and irresponsible vender of unheard of horticulture novelties, which the honest nurseryman who calls things by their right names and sells only varieties that are tested and reliable goes begging for customers?

It seems to me that of all classes to be taken in by fraudulent representations, the farmer is the most susceptible. His calling naturally isolates him from the society of his fellow men. If he neglects to inform himself upon the current topics of the day, wraps himself up in a cloak of self-conciet, eschews all book knowledge as unpractical, he is a fit subject for the Bohemian oats man, the Russian fruit tree swindler, and the cloth peddler, or any other fraud.

I will venture the assertion that no active intelligent member of any live horticultural society ever gets humbugged by these men. They are studiously avoided by traveling frauds.

The Russian tree controversy that has been going on for some time in a number of the leading agricultural journals, will bear good fruit wherever these papers circulate, if the farmers have only read them. If it will educate them to move with more caution in buying unknown things through questionable sources, it will be a good thing.

I do not class all Russian trees as humbugs, and I am far from wishing to throw a wet blanket on the youthful ardor of the advocates and believers in Iowa success through Russian blood, but it is well enough to go slow, and not repeat the Morus Multicaulus craze, within the memory of some of our members. Unprincipled men are selling trees all over the west as genuine Russians that have been christened to suit their purposes, greatly to the detriment of honest men, and true horticultural progress.

The question naturally arises: Can anything be done to protect mankind from the human vampires that suck the substance from the unsuspecting. Yes, ignorance and credulity go hand in hand. Intelligence is the magic wand that frightens the monster, "Humbug."

LAKE CITY, Minnesota Nov. 23, 1887.

JNO. C. FERRIS, SECRETARY, *Northern Iowa Horticultural Society.*

DEAR SIR. Perhaps as welcome and eloquent an article as any, that will be read at your annual meeting in December, would be the statement from me as chairman of the committee on freight transportation from the Amer-

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ican association of nurserymen, that the western class committee, a committee embracing 58 lines of road, embracing all the lines touching Iowa, north, south and west, have established a rate where nursery stock boxed, shipped in box cars, will go as "*third class*" (3d class).

The fight was a hard one, the opposition *very decided* to any change, but the results have justified all the labor and expense.

The committee expect to continue their labors at all other meetings of freight committees other than the western, and if any of your members can supply any advice or arguments, we trust they will do so, with best wishes for a successful and profitable meeting.

I am respectfully yours

S. M. EMERY, *Chairman Transportation Committee.*

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